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ABSTRACT

Utilizing mainly Chinese publications, this paper reviews the existing data on childhood diseases in order to assess the health status and morbidity patterns of Chinese children. China's infant mortality rate is among the very lowest in the developing world. The number of post-neonatal deaths as a proportion of total infant deaths has decreased to a level comparable to that of a developed country. The epidemiologic pattern of vaccine preventable diseases indicates that immunization activities have had a significant impact on the occurrence of these diseases. The overall prevalence of infectious diseases is decreasing and, relatively, the frequency of congenital defects is increasing as a major cause of childhood mortality. However, fecal-borne diseases such as dysentery, hepatitis, and ascariasis are still the predominant causes of morbidity. A secular improvement in the nutritional status of Chinese children is noted, but mild to moderate malnutrition still persists. Discussion focuses on several issues: the impact of the one-child family policy, which is creating different demands on the maternal and child health care service network; technological shortcomings in immunization activities, which are affecting coverage; the lack of better technical training, which is influencing health reporting and surveillance systems; and the lack of corrective programs to further decrease malnutrition. (Author/RH)

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Child Health in China

Mary E. Young
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ABSTRACT

This paper reviews the existing data, mainly Chinese publications, on childhood diseases in order to assess the health status and morbidity patterns of Chinese children.

China's infant mortality rate is among the very lowest in the developing world. The number of post-neonatal deaths as a proportion of total infant death has decreased to a level comparable to that of a developed country. The epidemiologic pattern of vaccine preventable diseases indicates that immunization activities have had a significant impact on the occurrence of these diseases. The overall prevalence of infectious diseases is decreasing and, relatively, the frequency of congenital defects is increasing as a major cause of childhood mortality. However, fecal-borne diseases such as dysentery, hepatitis, and ascariasis are still the predominant causes of morbidity. A secular improvement in the nutritional status of Chinese children is noted, but mild to moderate malnutrition still persists.

This review sets out a series of issues: the impact of the one-child family policy, which is creating different demands on the maternal and child health care service network; technological shortcomings in immunization activities, which are affecting coverage; the lack of better technical training, which is influencing health reporting and surveillance systems; and the lack of corrective programs to further decrease malnutrition.

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I. INTRODUCTION

In China, one-third of the population is under 14 years old, i.e. 338.7 million people. The crude birth rate was highest in the mid-1950s, when it reached 45 per 1,000 population. Since then, the birth rate has declined to about 20 per 1,000 in 1982. According to the 1982 census, more than 20.7 million births occurred in 1981. The proportion of children in the total population in the 1982 census was lower than that in the 1953 and 1964 census. 1/ This is in part a result of family planning and population control. At the same time, health policies have supported the improvement of environmental health standards and the provision of more adequate maternal and child health care in the community. These measures contributed to the decline in child mortality, particularly infant mortality. As the rate of child survival improves, the birth rate decreases. In China today, every child is a wanted child.

Many visitors to China, especially those familiar with other developing countries, are surprised by the apparent good health of Chinese children. There is no acute malnutrition. Those children seen on the streets radiate cheerfulness and vitality. However, quantitative data, such as nationwide age-specific morbidity and mortality statistics for children in China, are scarce and difficult to obtain. Annex Table 1 presents an urban and rural comparison of age-specific mortality rates for 1957 and 1975. Death rates declined between 1957 and 1975 for every age group, most drastically for infant mortality. The rural infant mortality is about twice that of urban. Based on a two-year (1974-1976) review of infant mortality in 12 provinces and cities, the rural infant mortality rate was 2 to 4 times that of urban. 2/ The magnitude of the urban/rural difference in the age groups between 1 and 10 years is smaller; it varied between a factor of 1 and 2. The urban/rural difference in 1957 was greater than in 1975. Annex Table 2 and Annex Map 1 present the crude birth rate by province in 1982 based on the 10 percent sampling of the 1982 census. The percentage of infant deaths varied from 27 percent in Ningxia to 4 percent in Shanghai. Population age distribution data by province were not available to calculate the age-specific mortality rate. An alternative is to use an adjusted age-specific mortality rate. However, using a standard population, in this case, does not provide a better comparison because of the difference in population age distribution among the provinces. The Chinese population policy for minorities is different from its overall policy: minorities are exempted from policies on population

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1/ "Age Distribution of China's Population," Beijing Review, No. 1 (1984): 20-22.

2/ "Rural Preschool Child Health Care Organization, Content and Methods," Chinese Medical Journal 95 (August, 1982): 551-6. This article cites a 2-year review (1974-1976) of infant mortality in 12 provinces and cities conducted by the Child Health Care Department, Institute of Pediatrics, Chinese Academy of Medical Science; data, however, were not presented.

control. Ningxia, with a large minority population (54 percent are Hui), has a higher birth rate, and its population age distribution is different from other provinces, that is, it is younger. Thus, in addition to urban and rural differences within provinces, there is a regional difference in the mortality rate for both infants and children of age 1 to 10. The proportion of deaths for infants and children in Guizhou of the southwest region, and in Gansu and Ningxia of the northwest region are higher than that of other provinces.

The major factors responsible for improvement in the health status of children in China should be attributed to the government's emphasis on prevention, on community mobilization in the organization of mass campaigns, on the improvement of environment sanitation, on the improvement of nutrition, and on organization of the basic network of maternal and child health care centers and personnel at each level, from province to brigade level.

This paper reviews the existing literature on childhood diseases in order to assess the health status and morbidity pattern of Chinese children, and to discuss issues relating to their health care needs. Section II describes perinatal health, focusing on maternal and infant morbidity. Section III reviews the most prevalent childhood communicable diseases. Section IV presents available anthropometric surveys and micronutrient diseases. Section V describes other childhood diseases, such as parasitic and endemic diseases. Section VI describes the existing network of maternal and child health care services, and section VII sets out a series of relevant issues.

II. PERINATAL HEALTH

A. Maternal Mortality

The maternal mortality rate is defined as the number of women who die as a result of child bearing in a given year per 100,000 births. Maternal deaths are those caused by complications of pregnancy and childbirth. Before liberation, the average maternal mortality rate in China was reported to be as high as 150 per 10,000 live births (range 32 to 171). Wray [3/] cites an estimate that in preliberation North China, 2 to 3 percent of all women going into labor died of complications due to pelvic deformity from osteomalacia.

In 1982, the reported national figure was 5 per 10,000 live births. The mortality rate has drastically declined over the last 30 years. However, urban and rural differences still exist, as shown in Table 1. The figures for

Table 1: Maternal Mortality Rate in Selected Urban and Rural Areas 1975, 1980 and 1982 (per 10,000 live births)

	1975	1980	1982
Urban [a/]			
Beijing	2.8	1.3	2.2
Shanghai	0.8	1.1	1.0
Tienjin	2.6	1.3	1.8
Rural [b/]			
Heilongjiang	4.5	4.2	2.5
Shangdong	4.1	3.7	2.8
Sichuan	5.1	6.4	3.9
Ningxia	11.7	9.2	8.6
National Average			5.0

a/ Data were obtained from Statistical Data on National Health Care, 1982, provided by the Ministry of Public Health.

b/ Data were obtained from the counties participating in this first World Bank health project; there were 10 counties from Heilongjiang, 15 counties from Shangdong, 16 counties from Sichuan, and 5 counties from Ningxia.

3/ Wray, J.D., "Child Care in the People's Republic of China - 1973: Part II." Pediatrics, 55 (May, 1975): 723-734.

rural areas were calculated from data on 46 counties in 4 provinces (Shangdong, Heilongjiang, Sichuan and Ningxia) participating in the first World Bank health project. Regional differences in the mortality rate may be related to differences in the availability of health resources and cultural practices. Mortality in Ningxia was about 70 percent higher than the national average.

The main causes of maternal deaths, as reported from a Shanghai hospital, but not in ranking order, were: eclampsia, ruptured uterus, pulmonary embolism, and amniotic fluid embolism. 4/ This pattern is similar to other developed countries. Before liberation, postpartum fever, hemorrhage, and eclampsia were the major causes of maternal deaths. Postpartum fever is still a major cause of morbidity. Hemorrhage and infection are no longer the leading causes of death, which indicates that better standards of care are available, and a substantial proportion of "avoidable" deaths have been prevented.

Perinatal mortality includes stillbirth from 28 weeks gestation and death of a live infant (of any gestation) up to one week after birth. Annex Table 3 provides information from selected sources in 17 provinces and cities between 1953 and 1979 on perinatal mortality. 5/ The perinatal mortality rate varies among provinces. The average perinatal mortality was 20.48 per 1,000 live births (range 13.12 to 20.48). Within each province or city the rate also varies, which may be due to differences in reporting, differences in ascertainment of births and deaths, and bias in sample selection (see Table 2). The actual perinatal mortality rate is most likely higher, since these data were collected from major cities or provincial hospitals rather than from the entire province, including both rural and urban areas. There is also a difference in the reporting of deaths. In Shanghai data, abortions in late pregnancy (i.e. third trimester) and neonatal deaths within 7 days of birth occurring outside the hospital were not included in the nominator.

The major causes of perinatal mortality were prematurity, difficult labor, eclampsia, congenital defects, and asphyxia. Clinicopathological correlation with autopsy of perinatal deaths showed that the causes of death were: first, respiratory (hemorrhage, hyaline membrane disease); second, asphyxia; and third, congenital malformation. Comparison with several countries is presented in Table 3.

4/ Chalmers, I. "Better Perinatal Health - Shanghai," The Lancet, No. 1 (1980): 138.

5/ Much information was lost as a result of the way the data was presented. The total number of perinatal deaths were reported by different time periods instead of by year. For instance, Nanjing Hospital reported a total number of 541 perinatal deaths from 1953 to 1978. Thus, the pattern of changes over the last 20 years is not obvious. Even so, the data do show that perinatal mortality varies among provinces.

Table 2: International Comparison of Perinatal Mortality Rates

Year	Country	Mortality Rate		
		Perinatal	Fetal	Neonate
1974	Sweden	13.0	-	-
1974	Switzerland	15.0	-	-
1974	France	19.3	-	-
1971	Holland	17.9	10.3	7.6
1971	Canada	20.3	9.4	10.9
1971	England	22.5	12.6	9.9
1971	Scotland	24.8	13.3	11.5
1974-77	Shanghai	14.2	7.8	6.5

Source: "Retrospective Analysis of Perinatal Mortality within 17 years, 1961-1977," Chinese Journal of Obstetrics and Gynecology, 13 (October, 1978): 121.

Table 3: Causes of Perinatal Mortality, by Rank Order, Several Countries

Cause of Death	Shanghai	Holland	Canada	England	Scotland
Asphyxia	1	2	1	2	2
Congenital defects	2	4	4	1	1
Placenta insufficiency		3	3	4	3
Cord abnormality	4		5		
Difficult labor	5				
Other	3	1	2	3	4
Toxemia		5		5	
Birth injury					5

Source: "Retrospective Analysis of Perinatal Mortality within 17 years, 1961-1977," Chinese Journal of Obstetrics and Gynecology, 13 (October, 1978): 121.

B. Infant Mortality

The infant mortality rate (IMR) is the number of infant deaths under 1 year of age per 1,000 live births in a given year. The IMR has declined from 200 per 1,000 live births in 1949 to 53 per 1,000 live births in 1980. The pattern of decline is similar between the Beijing data and nationwide data, but the nationwide data indicated a drastic increase in the period 1960 to 1961. Major agricultural failure occurred during this period, in part due

to two successive years of bad weather, and in part due to economic mismanagement associated with the Great Leap Forward. Beijing, being the capital city, probably was less seriously affected by the famine and agricultural failure.

Figures from Beijing from earlier years (1926-1934) are given in Table 4. These figures are not representative of rural China or of Chinese cities. The data was collected from the First Health Special Area established in 1926 in a northeastern section of Peking and covering a population of 55,000. The relatively high sex ratio for several years may reflect underreporting of female infanticides. One feature of infant mortality in old China was the predominance of female over male deaths.

More recent infant mortality rates from various sources are also presented in Table 4; Figure 1 shows the trend over the last 30 years. The decline has been drastic; the reported IMR in China today has reached levels much lower than that of countries of comparable per capita gross national product. The official national estimate was 20.3 per 1,000 live births in 1982.

The World Bank estimates of infant mortality rates are higher than the official figures. In order to fit the available data on age-specific mortality rates from China, the Bank used a modified "West" model life table which applies a different "West" mortality level for different age groups. This resulted in a higher infant mortality rate for given life expectancy than the unmodified "West" models. The official figures were obtained from reporting of selected urban and rural areas (which by no means are representative for China as a whole). Underreporting and the extent of underreporting vary from place to place, depending on the quality of the existing reporting system. Infant deaths might be reported as stillbirths and vice versa, or might not be reported at all. Infanticides may be reported as stillbirths. A verification survey of infant deaths was conducted in Chongqing county, Sichuan in 1981, and 33 percent of infant deaths were unreported. 6/ Another survey in Jingan County, Shanghai, found 5 percent underreporting. 7/

Age-specific death rates have declined for all ages, but the IMR still accounts for 50 percent of deaths for children less than 14 years of age. The major causes of deaths in Old China were diarrhea, malnutrition, tetanus, and birth injury. Today, infectious etiology is contributing to fewer deaths. Congenital defects, premature birth, and birth injury are taking up a greater share in the cause of deaths (see Table 5). In the urban areas, about 80 percent of infant deaths are due to pneumonia, congenital

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6/ "Underreporting of Infant Deaths in Chongqing County," Chinese Journal of Epidemiology 4 (1983): 172-73.

7/ "Correctness of Infant Mortality Statistics," Chinese Journal of Pediatrics, 21 (1983): 213-14.

Table 4: Infant Mortality Rates, 1926-1982

	Estimated infant mortality rate (per '000)		
	Both Sexes	Male	Female
Beijing - First Special Health Area [a/]			
1926	183.2	172.5	194.8
1927	176.4	174.0	179.1
1928	197.2	197.6	198.7
1929	172.7	165.6	189.5
1930	142.2	163.6	119.7
1931	199.3	179.1	203.0
1932	179.3	185.4	172.3
1933	134.0	137.6	129.0
1934	126.2	138.6	113.1
Ting Hsien [b/]			
1931	-		
1933	199.0		
1934	163.1		
1935	185.2		
1936	145.0		
Farm Areas - 22 provinces, 1929-1931			
All areas	160.0	152.0	
North China	152.0	159.0	
South China	166.0	147.0	
4 provinces, 1924-1925	129.4		
Chen-Kung [c/] 2/1940 - 6/1944	212.1	211.1	
China, overall - 1949	250-300		
Beijing, city proper			
1949	117.6		
1950	95.5		
1951	86.6		
1952	65.7		
1953	59.3		
1954	46.1		
1955	44.5		
24 provinces, rural areas, 1955	110.0		
Beijing, city proper			
1960	29.8		
1972	15.0		
China, most of the country			
1973-75	53-63		
1978-79	56		
1982	22 (?)		

a/ First Special Health Area was established in 1926 in a northeastern section of Beijing with a population of 55,000.

b/ Ting Hsien, is a rural area situated 170 miles south of Beijing, with a population of 397,000.

c/ Chen-Kung is a county located in Yunan province, with a population of 71,723.

Sources:

1. Data for First Special Health Area, Ting Hsien, Farm Areas, Four Provinces, Chen-Kung, and Beijing City Proper are presented in Table 2, and Table 11 of China - Facts and Figures Annual, Volume 6, 1983, by H. King and F.B. Locke.

2. The figures for 1973-75 and 1978-79 for China as a whole are presented in Table A.27 of China, Socialist Economic Development, Volume III, World Bank Country Study, 1983.

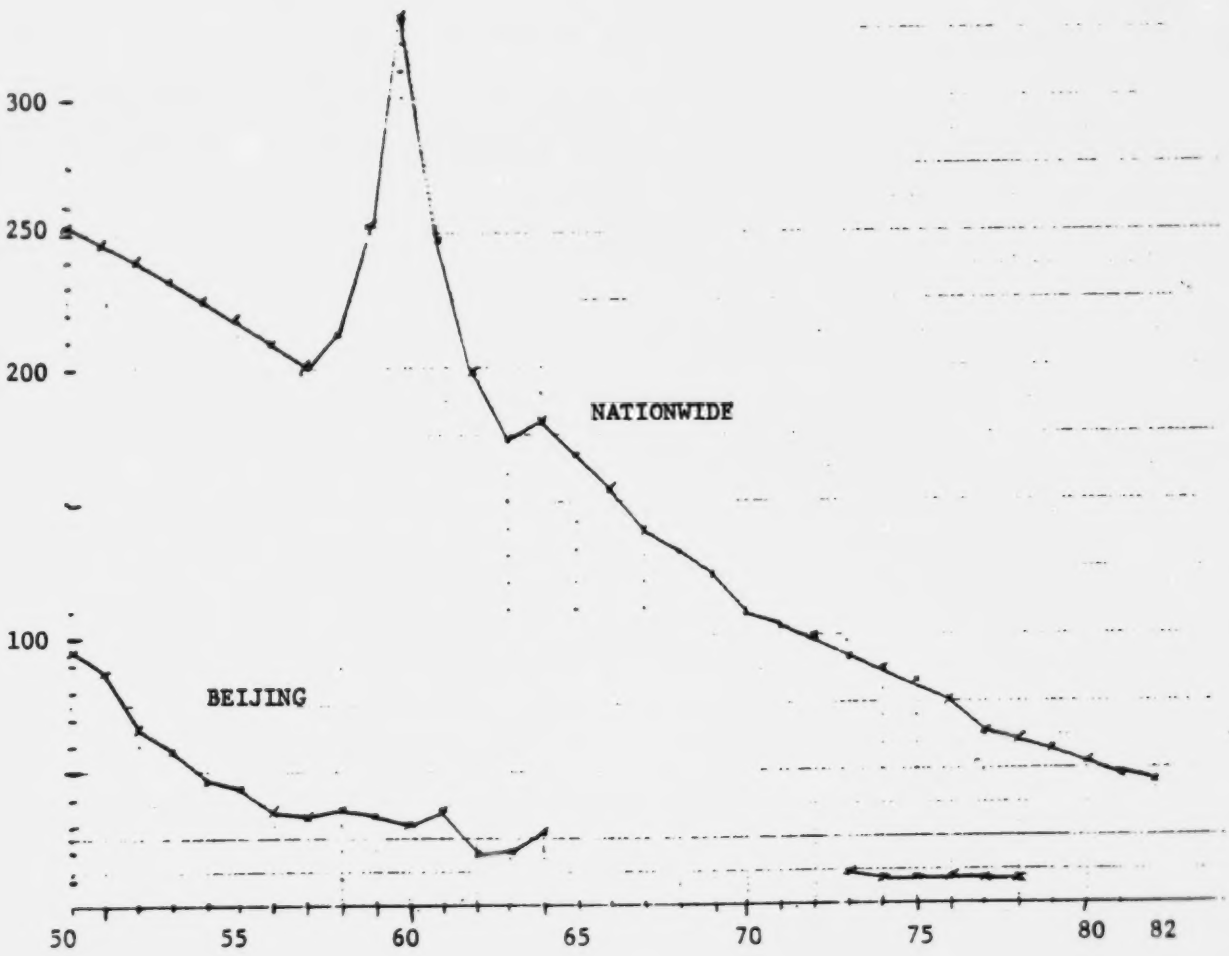

Figure 1. Infant Mortality Rate, 1950-1982, Nationwide, and Beijing

Sources: The nationwide figures were obtained from Table A-2, "Health Sector Report on China," Population, Health and Nutrition Department, World Bank, April, 1984. The Beijing figures were obtained from Lin, Y.Z., "China's 30 Year Mortality Rate," Chinese Journal of Preventive Medicine, 15 (1981).

Table 5: Five Leading Causes of Infant Deaths as a Percentage of Total Infant Death

Causes	Shanghai County 1/ (1980)	Beijing 2/ (1979)
Congenital anomalies	20	19
Premature births	18	15
Asphyxia	15	8
Pneumonia	14	24
Congenital heart disease	11	11

Sources: 1/ Hu, X.J., et.al., "Child Health Care," American Journal of Public Health, 72 (September, 1982): 37.
2/ Table A.23 of China Socialist Economic Development, Vol. III, a World Bank Country Study, 1983.

defects, premature birth, and birth injury. The incidence of tetanus has declined to negligible levels in the cities. In the rural areas, tetanus and pneumonia still account for about 40 percent of infant deaths. In Ningxia, the neonatal tetanus mortality rate was as high as 51 per 100,000 live births in some counties.

The factors underlying improvement in infant health are complex. Aside from a general rise in living standards and better sanitary conditions, progress in prenatal, intrapartum, and neonatal care also contribute significantly to improved pregnancy outcome and reduced neonatal mortality.

C. Neonatal Mortality

It is important to note that the neonatal mortality rate, that is, deaths in the first 28 days of life per 1,000 live births, is now about 50 to 70 percent of infant deaths (see Annex Table 4). This is the pattern seen in industrialized countries where most infant deaths occur in the first month of life. The mortality rate secondary to diseases of newborns from 28 rural surveillance points was 6.26 per 100,000 population; it ranks 11th in the total causes of death for all ages, and accounts for 1 percent of total deaths for all age groups. 8/ In 1949, the neonatal mortality rate ranged between 56.5 to 188.0 per 1,000 live births. The major causes of death were congenital syphilis (26 percent) and neonatal tetanus (5 percent). The causes of neonatal mortality today are prematurity (26 percent), asphyxia (22 percent), congenital malformation (13 percent), and infections (14 percent).

8/ Data from Institute for Epidemiology and Microbiology, Chinese Academy of Medical Sciences.

This pattern is similar to developed countries, whereas in many developing countries of China's level of economic development, malnutrition and infection are still the predominant causes of infant death.

Although published neonatal data from China are limited, those that exist report a low incidence of low birth-weight (LBW) births. China's incidence of low birthweight is lower when compared to other developed and developing countries (see Table 6). Its incidence of LBW was about 6 percent in 1981. The incidence of low birth weights reported by the International Peace Maternity Hospital, Shanghai, was 4.7 percent, compared with an overall rate of 6.8 percent in the United States (5.7 percent for whites, 12.5 percent for blacks in 1982). This low incidence may be due to underreporting of the births of very small babies and sampling bias (that is, hospital data underrepresent the population). But several factors give evidence of internal consistency within the data. Chalmers [9/] compared some risk factors of low birth weight at the maternal hospital in Shanghai and Cardiff (Wales), and the prevalence rate of these risk factors was generally lower in Shanghai. The rate of multiple pregnancy is 7.2 per 1,000 in Shanghai, with 11.1 per 1,000 in Cardiff; the incidence of hypertensive disorder is 12 per 1,000 women in Shanghai and 45 per 1,000 women in Cardiff; the prevalence of congenital malformation is lower in Shanghai than in Cardiff (see Annex Table 5). In addition, teenage pregnancies and smoking are rare among Chinese women.

Table 6: Global Incidence of Low Birth-Weights

	Percentage of Live Births
Asia	20
Africa	15
Oceania	12
Latin America	11
USSR	8
Europe	8
North America	7
China	6

Source: WHO, World Health Statistics Quarterly. "The Incidence of Low Birth-Weight: A Critical Review of Available Information," Vol. 33, No. 3, Geneva, 1980.

It is possible that genetic influence plays a role in the favorable distribution of birthweight. A vital statistics report from the U.S. National

9/ Chalmers, I. "Better Perinatal Health-Shanghai," The Lancet, No. 1 (1980): 137-39.

Center of Health Statistics, 1982, reported that 4.9 percent of Chinese babies born in the U.S. weighed less than 2,500 grams, whereas the incidence of LBW is 5.7 percent among white babies. 10/ The differential in the low birth weight between these races was the same when controlled for the duration of mother's education. Another possible explanation may relate to certain traditional Chinese values and living habits that might be conducive to favorable fetal and perinatal development. The incidence of LBW is a powerful determinant of mortality risk in fetal, neonatal, and postneonatal life. The apparent low incidence of LBW deserves a closer investigation. Comparison of national statistics could provide a better understanding of nationwide variation in the incidence of LBW. If the incidence is consistently low, further research could be carried out to analyze possible contributing factors to the low incidence.

D. Diseases of Infancy

As discussed in the previous section, at least 50 percent of infant deaths occur during the neonatal period. The prevalence of morbidity among neonates is 30 percent. Low birth weight neonates have a high morbidity rate; the incidence is 50 percent, versus 29 percent in neonates of birth weight over 2,500 gm. The frequency of the morbidity pattern is as follows: communicable diseases, 30 percent; birth injury, 14 percent; congenital defects, 8 percent; hematologic diseases, 6 percent; respiratory diseases, 5 percent; digestive diseases, 4 percent; and others (such as apnea, diarrhea and dehydration, hydrocephalus, heart failure, craniotabes, etc.), account for 33 percent. Neonatal tetanus and congenital defects will be discussed in this section.

Neonatal Tetanus

The World Health Organization estimates that neonatal tetanus is responsible for 90 percent of the 1 million annual deaths related to tetanus in the world. Before liberation, neonatal tetanus was one of the causes of infant death; about 5 percent of neonatal deaths were due to tetanus. The incidence of death from neonatal tetanus has drastically declined over the last 30 years. The average incidence was 6 per 10,000 births in 1982 for the 46 above mentioned counties in 4 provinces (Heilongjiang, Shangdong, Sichuan, and Ningxia), with a range from 0 to 51.

Tetanus bacterial spores are common in soil, especially when manure is used as a fertilizer, a common practice in China. Thus, there is no hope of eliminating the reservoir of infection. Even with accessible health services, the disease has a case fatality ranging from 40 to 90 percent in China.

10/ Taffel, S. "Characteristics of Asian Births: United States, 1980," Monthly Vital Statistics Report, Vol. 32, No. 10, February 10, 1984, U.S. Department of Health and Human Services.

The disease is preventable at low cost with cord hygiene and maternal vaccination during pregnancy. A major contributing factor to the reduction of neonatal tetanus mortality may be the increased availability of maternal and child health services. Between 1949 and 1952, the national total of maternal and child health stations and centers increased from 9 to 2,379. The number of registered midwives increased from 13,900 in 1969 to 73,305 in 1982. In addition, there are 549,659 part-time midwives, and about 1 midwife per 1,600 population (or 6 midwives per 10,000 population). MCH services are accessible at every level, and at least 90 percent of deliveries are conducted with the "scientific method" of using sterile tools (see Table 7).

Table 7: Proportion of Deliveries Using the "Scientific Method" in China

Year	Total	Urban	Rural
1977	88.5	98.2	87.6
1980	91.4	98.7	90.3
1982	92.7	98.6	91.6

Source: Statistical Data on National Health Care, 1982, Ministry of Public Health, March, 1983.

Congenital Defects

Congenital malformation among infants has been estimated as high as 20 per 1,000 births. [11/] The overall prevalence based on Shanghai hospital data was 6.4 per 1,000 live births. As the prevalence of communicable diseases gradually declines, the relative prevalence of hereditary disorders increases. In the U.S., approximately 30 percent of children in hospitals are there because of genetically determined or influenced disorders. Data from Beijing also shows similar proportions. About 20 percent of total deaths for infants were due to congenital defects in 1979. During 1974-1976, 30 percent of death causes for children aged less than 15 were due to congenital or hereditary disorders. [12/] A comparison of hospital admissions between 1963 and 1978 in Shanghai illustrated that increasing proportions of admissions were due to genetic disorders or congenital malformations compared to infections and general pediatric ailments (see Table 8).

11/ Tien, H.Y. "China: Demographic Billionnaire," Population Bulletin 38, (April, 1983): 25.

12/ Li, C.D. and C.T. Zu, "Prevalence of Patients with Congenital Defects, 1963 and 1978", Chinese Journal of Pediatrics, 18 (1980): 210-13.

Table 8: Disease Classification of Pediatric Admissions in Pediatrics Hospital Affiliated with Shanghai First Medical College, 1963 and 1978

Disease Classification	Number of Admissions 1963		1978	
Hereditary	237	(5.3)	435	(10.0)
Congenital defects	131	(2.9)	202	(4.7)
Malignancies	50	(1.1)	74	(1.7)
Infections and other	4,058	(90.7)	3,612	(83.6)
Total	4,476	(100.0)	4,323	(100.0)

Source: Li, C.D. and C.T. Zu, "Prevalence of Patients with Congenital Defects, 1963 and 1978," Chinese Journal of Pediatrics, 18 (1980): 210.

Of the congenital defects among newborns, 74 percent are of the nervous system, 11 percent of the skeletal system, and 8 percent of cleft lips 13/ (see Table 9).

Table 9: Percentage Distribution of Types of Congenital Defects

	Percent
Nervous system	74
Skeletal system	11
Cleft lip	8
Gastrointestinal	3
Endocrine/reproductive	2
Cardiovascular	2

Source: "Analysis of Congenital Defects," National Medical Journal of China, 62 (1982): 141.

Congenital defects are becoming an increasingly important issue, especially under the one-child-per-family policy. Couples restricted to one

13/ Chen, Y.C. "Analysis of Congenital Defects", Medical Journal of China, 62 (1982): 141.

child want reassurance that their child will be healthy. Although Article 6 of the 1980 Marriage Law specifically prohibits marriage among persons who are direct blood relations or collateral relatives within three generations, marriages among relatives are still prevalent among the minority population and people in the geographically distant areas. A survey of the percentages and types of consanguineous marriage in the Hans and 10 national minorities was carried out from May 1980 to January 1981. Marriage was considered to be consanguineous when husband and wife have a common ancestor within five generations. The percentages of consanguineous marriages were: 1 percent for Hans in Beijing and Hubei, 14 percent for Yi minority in Sichuan and Gansu, 10 percent for the Hui minority in Gansu, 3 percent for the Dongyang minority in Gansu, 3 percent for the Ewenki minority in Inner Mongolia, 2 percent for the Eroqen minority in Heilongjiang and Inner Mongolia, 1 percent for the Li minority and 1 percent for the Miao minority on Hainan Islands, and 0 percent for both the Korean and Tibetan minorities in Jilin and Xizang. 14/ It is estimated that 3 to 9 percent of infants born to couples who are first cousins are affected by hereditary disease, compared to one-tenth of a percent among offsprings of marriages of nonrelated persons. 15/ Health education and marriage policies play an important role in preventing the 'avoidable' factor which increases the risk of congenital defects. However, restrictions in urban and rural population mobility may inadvently result in higher frequency of inter-marriage in a village with the same family name for populations residing in very remote areas.

Genetic services, such as prenatal diagnosis by amniocentesis with biochemical or karyotype analysis of fetal cells or amniotic fluid, are the best available strategies for most genetic disorders, which are now under great demand in the counties and provincial health facilities. Many county level MCH centers are attempting to set up genetic screening.

Neonatal Ophthalmia

After liberation, the government carried out an extensive program to eradicate venereal disease. This program included the closing down of prostitute houses, prohibition of prostitution, establishment of prevention and treatment centers, organization of medical personnel for venereal disease eradication, mass screening, and active treatment with special emphasis on syphilis in pregnant women. As a result, venereal disease was eradicated. Statistics from the Peking Medical College show that the incidence of congenital syphilis dropped from 10 percent in 1949 to 0.7 percent in 1955.

14/ Du, R.F., et. al., "Percentage and Types of Consanguineous Marriage in Different Nationalities in China," National Medical Journal of China, 61 (1984): 723.

15/ Tien, H.Y. "China: Demographic Billionnaire," Population Bulletin, 38 (April, 1983): 25.

Today, such cases are not encountered. 16/ Neonatal ophthalmia, an acute purulent conjunctivitis occurring in infants within the first 3 weeks of birth and associated with maternal gonorrhea infections, has not been reported. Topical prophylaxis with solutions such as silver nitrate applied immediately postpartum is an effective preventive measure which should be continued, even though venereal disease has been eradicated. The increased influx of travellers to China in recent years will inevitably reintroduce sexually transmitted diseases.

16/ "Child Health Care in New China," Americal Journal of Chinese Medicine, 2 (1974): 149-158.

III. CHILD HEALTH

In relation to other age groups, mortality rates for children are very low. The rate for children aged 1 to 3 is one-half that for infants, and the rate for children aged 3 to 7 is one-tenth that for infants. About 50 percent of the deaths among children aged 1 to 4 were due to cancer, respiratory diseases, and congenital defects mainly of nervous system (see Table 10). Malnutrition was still among the 7 leading causes of death for infants under age 1 and children aged 1 to 4. The leading causes of death for urban children 1 to 4 years of age is becoming similar to the pattern in the United States. In the U.S., accidents, cancer, congenital anomalies, and pneumonia are the 4 major causes of deaths.

Table 10: Major Causes of Death at Ages 1 to 14, Beijing, 1979

Age	Cause	% of total deaths
Under 1 year	Respiratory disease	23.5
	Genetic deformity	19.1
	Premature birth	15.0
	Heart disease	10.6
	Trauma or asphyxia at birth	8.2
1 to 14 years	Malignant tumors	20.4
	Respiratory disease	16.3
	Nervous system disease	14.3
	Heart disease	12.2
	Digestive system disease	8.2
5 to 14 years	Nervous system disease	15.3
	Malignant tumors	14.1
	Accidents, trauma	10.6
	Heart disease	9.4
	Respiratory disease	7.1

Source: From Table A.23 of China, Socialist Economic Development, Vol. III, a World Bank Country Study, 1983.

The pattern of childhood morbidity resembles that of other developing countries. The most frequent illnesses for children less than 10 are respiratory diseases, acute gastroenteritis, external injuries and skin diseases. Table 11 shows the morbidity pattern for children in Qufu County, Shangdong province, during September and October, 1982.

Table 11: Five Most Common Diagnoses made by Barefoot Doctors per day, by Age, Listed in Rank Order, in Two Communes, Qufu County, September and October, 1982

Diagnosis	Up to 1 year	1-5 years	6-14 years
Common cold	5	1	1
Bronchitis, pneumonia, asthma	2	3	5
Enteritis	3	4	3
Other gastrointestinal diseases	1	2	4
External injury			2
Skin disease	4	5	

Source: Young, M., "Study of Barefoot Doctor's Activities," Johns Hopkins University, Baltimore, unpublished thesis for Dr.P.H., 1984.

A. Acute Gastroenteritis

Acute gastroenteritis is a group of clinical enterities, mainly of infectious origin, consisting of dysentery, typhoid and paratyphoid fevers, cholera, infantile diarrhea, food poisoning, and indigestive diarrhea. Reporting is based largely on clinical criteria. Bacterial culture or stool microscopic examination are seldom made at the commune and brigade level.

Among the 24 notifiable diseases, dysentery ranks second, after influenza. Of all diarrheal deseases, dysentery heads the list of reported cases. Bacillary dysentery implies shigellosis. Shigella flexneri, followed by Shigella sonnei, are the predominant isolates. Shigella infection is most frequent in preschool children but may occur at any age. It is considered by the Ministry of Public Health to be China's most serious diarrheal disease problem. June, July, August, and September are the months of highest incidence.

Based on hospital admissions for diarrheal diseases at Shanghai First Medical College, dysentery is an overwhelming childhood disease; 65 percent of admissions of children below 2 years of age were due to dysentery. About 90 percent of pediatric outpatient visits with acute gastroenteritis were diagnosed as dysentery. This may be a selection bias. Only patients with severe symptoms are taken to hospitals. The incidence of dysentery has not reduced drastically over the last 30 years. In 1935, the dysentery-specific death rate in Tingxien, a district southwest of Beijing, was 250 per 100,000. The reported incidence rate from 1939-44 in 19 provinces was 25.9 per 100,000. In 1981, the national incidence was 349 per 100,000. However, underreporting in the earlier years may be the main reason for the continuing high incidence rate over the recent years.

Similarly, the reported incidence of acute gastroenteritis for Shanghai in 1979 was 1,000 per 100,000, and Guandong was 264 per 100,000; this is one-fourth the rate of Shanghai. The differences reflect the relative completeness of reporting in Shanghai rather than an actual lower incidence in Guangdong (Annex Table 6).

A diarrhea morbidity and mortality survey on 5,789 households was conducted in Shanxi province in 1982. Of the 2,527 children less than 5 years old, 45 percent developed a new episode of diarrhea during the prior 2-week period. If based on the assumption that the surveys were representative of the entire year, the annual diarrhea incidence in children under 5 years of age would be 1.2 episodes per child per year. This most likely is an underrepresentation due to sampling bias and selection of populations. The incidence is lower than the mean annual incidence of the U.S., which was 1.9 in the under-5-year olds (Tecumseh study). 17/

A number of viral pathogens, such as rotavirus and parvovirus-like agents, are associated with clinical symptoms in children below the age 5. Dehydration is a typical feature of these illnesses. Very few studies have estimated the incidence of diarrhea associated with rotavirus or parvo-like agents due to lack of diagnostic tools in general clinical settings. In developed countries, close to 50 percent of children aged 1-3 years who are hospitalized for severe diarrhea are infected with rotavirus; a similar frequency of rotavirus in severe dehydrating diarrhea has been found in several developing countries. 18/

The incidence of cholera has decreased to 0.008 per 100,000 in 1981, and the cases are mainly imported, which means they occur along the southern border of China, such as Guandong and Fujian Provinces. The incidence of typhoid and paratyphoid was 7.6 per 100,000 in 1981. It has increased between 1974 and 1981. This increase, however, is due to improvement of the reporting system rather than actual higher incidence. Highest attack rates occur to the age group of 5 to 19. There is no data available on the prevalence of Amoebiasis, a severe parasitic dysentery. Annex Table 4 presents the incidence of cholera, dysentery, typhoid, and hepatitis by province in 1981.

B. Acute Respiratory Infections

The pathogens involved are multiple, such as the respiratory syncytial virus, parainfluenza viruses, rhinoviruses, coronaviruses, adenoviruses, and also measles, which produces respiratory manifestations as one component of a more generalized disease. A serological survey in Beijing

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17/ Last, John M. Public Health and Preventive Medicine, New York: Appleton Century Crafts, 11th Edition, 1983.

18/ Ibid.

on children under 14 showed that parainfluenza type I and III are the most common, followed by influenza type A, then respiratory syncytial virus. 19/

It is not possible to determine etiology on clinical grounds; the illnesses are usually enumerated simply as common colds. The distribution of these illnesses is highest in younger children and decreases with increasing age.

Respiratory syncytial virus is considered the most important agent of respiratory infection among infants and young children because of its capacity to cause life-threatening bronchiolitis and pneumonia. Major outbreaks occur in the winter of alternate years; then in the next year, a smaller outbreak takes place in the spring. Reinfection with the virus throughout life is common. About 30 percent of a sample of children under 14 in Beijing had antibodies to respiratory syncytial virus.

Acute respiratory infections rank second as a cause of outpatient visits in brigade health stations. The prevalence of acute respiratory infections including pneumonia among children was 7 to 8 percent in Heilongjiang and Sichuan Province. Pneumonia, either viral or bacterial, is still a major cause of morbidity and mortality for infants and children. Respiratory diseases account for one-third to one-fourth of all causes of illness in neonates. The fatality rate of neonatal pneumonia can be as high as 20 percent.

C. Vaccine-Preventable Diseases

Immunization is one of the major contributing factors to China's remarkable improvement in the health condition of its population. Since liberation, a basic network for child health care was built up, and since the 1960s mass immunization campaigns for childhood diseases have been established and become routinely implemented. Five vaccines are administered to all children: Bacillus Calmette-Guerin (BCG) against tuberculosis, oral poliomyelitis vaccine, diphtheria and tetanus toxoids combined with pertussis (DPT), and live attenuated measles vaccine. Vaccines are administered by Barefoot Doctors and MCH services. The present schedule for routine immunization campaigns is shown in Annex Table 7. A modified schedule is progressively introduced with the implementation of the WHO sponsored Expanded Programme of Immunization (EPI). The impact of this activity is evident, as the incidence of vaccine-preventable diseases have decreased remarkably in both urban and rural areas.

Vaccinations are given in organized campaigns because of lack of adequate cold chain resources in rural areas. Thus, vaccinations are given once a year for each type of vaccine, during campaigns of one to several days, organized at the county level. The dates for vaccination are arranged in

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19/ Zhao, J.M. et.al. "Investigation on Antibodies Against Respiratory Tract Virus in Children," National Medical Journal of China, 62 (1982): 723-26.

advance. Barefoot doctors notify the eligible children (that is, children who have attained the recommended age). Annex Table 8 indicates the number of children eligible and percentage coverage. Immunization coverage rates were well in excess of 90 percent for all the vaccines given. In the following sections we will discuss verification surveys for some of the diseases in an attempt to review the efficacy of the vaccination program.

Table 12 gives nationwide incidence rates for the childhood communicable disease during 1974-1981, and Annex Table 9 gives incidences for East District in Beijing from 1958 to 1979. Both sets of data indicate that the incidence for childhood communicable diseases have decreased over the years. The reported rates are lower in the cities than in the rural areas, but there is a significant degree of underreporting, the extent of which varies by disease between urban and rural areas.

Table 12: Nationwide Incidence of Childhood Communicable Diseases, 1974-1981 (per 100,000 population)

	Measles		Poliomyelitis		Diphtheria		Pertussis	
	incidence	CFR	incidence	CFR	incidence	CFR	incidence	CFR
1974	110.9	0.5	1.2	2	2.6	9	73.3	0.1
1975	149.5	0.8	0.8	2	4.1		82.8	0.2
1976	119.0	0.6	0.5	3	2.6	9	66.7	0.1
1977	107.9	0.6	0.8	3	3.2	8	70.3	0.1
1978	116.1	0.6	1.1	2	2.1	8	62.1	0.2
1979	92.9	0.7	0.6	3	1.7	8	41.4	0.2
1980	299.9	0.02	0.8	2	1.0	9	32.3	0.1
1981	206.1	0.02	0.5	4	0.9	10	27.2	0.2

CFR = Case Fatality Rate = Number of deaths per 100 cases of a given disease.

Source: Data provided by the Ministry of Public Health, October, 1982.

A recent survey was carried out to assess the validity of the reporting system in several urban and rural surveillance points (Annex table 10). The comparison between reported cases versus discovered cases (retrospective survey based on household visits) seems to indicate that the accuracy and the reliability of reporting is greater in rural areas. Differences are significant for hepatitis, but also for measles. It is surprising that reporting is less complete in urban areas, but it may be because the clinical symptoms are less severe in urban children, who have better nutritional status; hence, less frequent complications and less frequent health care services are sought.

Incidence of Vaccine-Preventable Diseases

Measles

Measles is a highly contagious disease, which 90 percent of the unprotected population aged under 5 years contract in many countries. Poor nutritional status seems to be the main factor leading to the most severe consequences of measles. Death is caused by pneumonia, diarrhea or, in a small number of cases, encephalitis in association with the disease. Maternal antibodies transferred through the placenta protect the infant during the first months of life. If measles vaccine is given to the infant before nine months of age, these antibodies may prevent the vaccine from producing immunity in the child.

Before the mass vaccination in China in 1965, epidemics of measles occurred in alternate years. During the epidemic years, the annual incidence was as high as 1,000 to 5,000 cases per 100,000 population, with a case fatality rate of 1 to 2 percent.

In 1965, when an attenuated measles vaccine was developed in China, a vaccination campaign was launched throughout the country. In its early years, the immunization program was not implemented simultaneously at all places, and outbreaks continued to occur; however, the incidence of measles declined in some areas. Since the late 1970s, the coverage of vaccination of children younger than 7 years of age has increased to over 90 percent. The incidence had dropped to below 20 per 100,000 for major cities by 1980 (see Annex table 9 for East Beijing). Nationally, the incidence was about 200 per 100,000 in 1981, and the fatality rate has decreased to less than 0.1 percent (Table 12). Figure 2 shows the decrease in the incidence of measles before and after vaccination. However, measles still account for an appreciable proportion of all cases of infectious disease.

The epidemiologic characteristics of measles have changed substantially with widespread vaccination campaigns. The age-specific incidence of measles has shifted to older age groups. In the prevaccine era, the incidence was highest among preschool children, especially those up to 4 years of age. More than 95 percent of children had measles by the age of 6. After mass vaccination, the number of measles cases in older age groups (5-14) represents two-thirds of total cases. [20/] This shift is due to an increasing proportion of young children being protected by immunization.

Before the vaccine era, the incidence of measles generally peaked in February and March, and fell in the winter or late spring. A change in this pattern has been observed in many places since the vaccination campaign was launched. The peak incidence occurs later in the year, shifting toward spring and summer. (See Figure 3.)

20/ Zhanq, Y.H. and W.N. Su. "A Review of the Current Impact of Measles in the People's Republic of China," Review of Infectious Diseases, 5 (1983): 415.

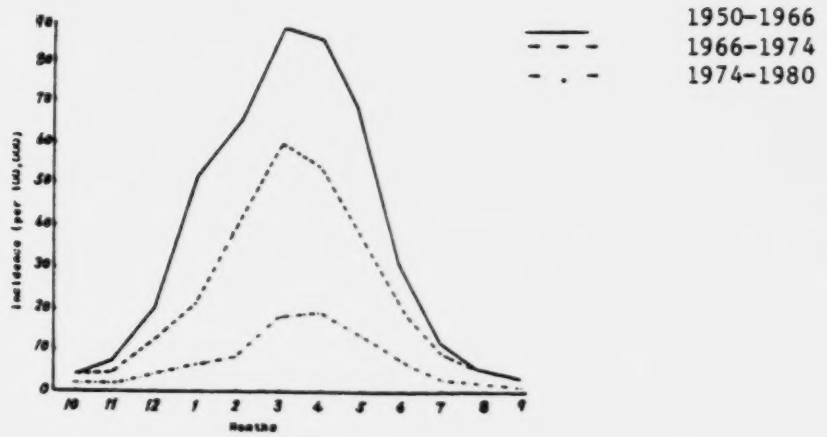

Figure 2. Average Monthly Incidences of Measles During the Three Epidemiologic Stages: (1) Prevaccination (———); (2) Early Vaccination (- - -); and (3) Scheduled Vaccination (- , - , -)

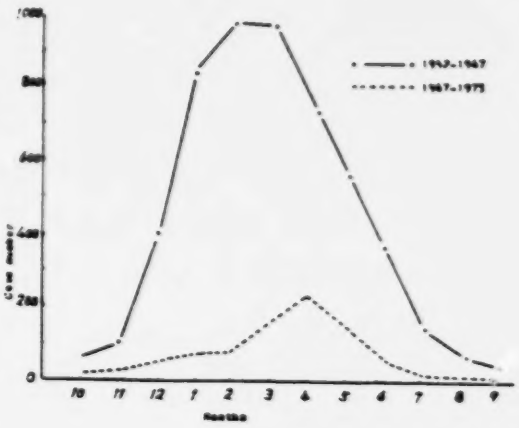

Figure 3. Monthly Number of Reported Measles Cases Before and After Widespread Vaccination in Ningbo City, Zheziang Province

Source: Zhang, Y.H. and W.N. Su, "A Review of the Current Impact of Measles in the People's Republic of China," Review of Infectious Diseases, 5 (1983): 414.

The epidemic pattern of measles is dependent upon the proper use of measles vaccine. If a high-quality vaccine is used, and if both vaccination coverage and the rate of successful vaccination are high, there should be no epidemic at all. Table 13 presents data which shows that the incidence of measles decreases as percentage coverage by vaccination increases. A seroepidemiologic survey was conducted in Mengcun county, Hebei Province, of 130,000 population [21] in 1978 after a measles outbreak. The outbreak occurred after the introduction of measles cases from outside the county, which propagated to a total of 116 cases in the county. An investigation of the immunization history of these cases showed that 49 percent (57 cases) were not vaccinated, and 51 percent (59 cases) received vaccination, of which 16 cases had received measles vaccine at age less than 1. Six cases had received measles vaccination twice.

Table 13: Relationship between Vaccination Coverage in 1976 and the Incidence of Measles in 1977 in Shanghai County

Vaccination Coverage in 1976 (%)	No. of Communes	No. of Children	No. of Cases	Incidence per 10,000
40-49	4	5,498	45	83.4
50-59	2	2,020	5	24.7
60-69	4	5,930	10	6.9
70-79	4	7,531	7	9.3
80-95	6	9,138	5	5.5
Total	20	30,017	72	24.0

Source: Zhang, Y.H. and W.N. Su, "A Review of the Current Impact of Measles in the People's Republic of China," Review of Infectious Diseases, 5 (1983): 413.

The problems are in the quality of vaccine, in the cold chain and the timing of vaccination. Freeze-dried vaccine is not yet available in China, and the liquid form currently used has a short period of potency. Patients who were vaccinated but failed to elicit an immune response may have received a vaccine that had lost its potency. Since vaccines need to be stored between $4^{o}C$ to $8^{o}C$ during transport, lack of knowledge about vaccine storage or lack of equipment for proper storage contribute to the ineffectiveness of a vaccine. In Gansu, the health officials reported that 85 percent of measles vaccines have lost effectiveness by the time of vaccination. In certain areas in China, the measles vaccination schedule are set for infants to receive the

21/ Wu, Z.Y., et.al. "A Seroepidemiologic Analysis of Measles," Chinese Journal of Epidemiology, 4 (1983): 4-7.

vaccine after 8 months of age. The optimal age for vaccination has been extensively researched. In developing countries, the risk of exposure to the infection at an earlier age versus the risk of failing to elicit an immune response when the vaccine is given too early (when maternal immunoglobulin is still present) in addition to the immature immune system, must be weighed in order to decide an optimal age for the vaccination. The consensus, therefore, is to administer measles vaccination after one year of age.

Pertussis

Pertussis is second to measles as a cause of morbidity and mortality among vaccine-preventable diseases in some developing countries and also in China. The World Health Organization estimates that up to 80 percent of unimmunized children will contract it. Pertussis, an acute bacterial infection affecting the respiratory tract, is very contagious in the first week or two of infection. The spasmodic coughing that characterizes the disease lasts one to two months. In very young children there is no characteristic whoop, so the disease may be difficult to recognize. Immunization requires three vaccinations which may begin as early as 2 months of age.

The incidence of pertussis in China has gradually declined. The incidence was about 30 per 100,000 population in 1981 nationwide, which is an underestimate. A verification survey indicated that underreporting is important in several urban areas (see Annex Table 10).

Poliomyelitis

Poliomyelitis is a viral disease spread by contact with objects, food or water contaminated with excreta. Poliomyelitis infection is universal, but most persons have no symptoms. The older the child at the age of infection, the more likely the infection will lead to severe sequella. Prior to 1955 epidemics were common, with local outbreaks occurring every year. Hence, the incidence of poliomyelitis varied greatly across localities. For example, in 1959, in Nanning, the incidence of poliomyelitis was 151 per 100,000; in Shanghai, the incidence was 30; in Tsingtao, 54; and in Kunming, 62 per 100,000, while incomplete aggregates of statistics from 17 provinces, municipalities, and autonomous regions showed an overall incidence of 5 per 100,000. Live attenuated polio vaccine was introduced in China in 1960, and since 1964 oral polio vaccine has been extensively supplied to the entire country. In 1971 the average incidence of poliomyelitis for China was 2.12 per 100,000, which has declined to 0.5 per 100,000 in 1981. (The rate is lower in the urban areas - 0.22 per 100,000 versus the rural areas of 1.05 per 100,000.)

Again, the incidence rate is likely an underestimate, since children affected may be asymptomatic. In 1981, a national survey on the evaluation of frequency of paralytic sequella of poliomyelitis was conducted in 12 provinces (which include a population of 3,521,373 under the age of 30). As a result, 4,241 cases of paralytic polio were detected; the average prevalence of paralytic poliomyelitis was 1.21 per 1,000 (see Annex Table 11). According to

the results of recent surveys, WHO proposes to multiply the prevalence of paralytic sequella by 1.25 to account for paralysis of muscles other than lower limbs, and then again by 1.33 to account for clinical poliomyelitis cases who either die or fully recover. This calculation indicates that the prevalence of clinical poliomyelitis among the population surveyed had been about 2 per 1,000.

The age-specific distribution of the prevalence rate in China indicates that there is an age shift of affected cases toward older age groups, which means that the mass campaigns have offered increasing coverage and protection among the younger age groups. The age shift is more markedly observed in urban areas: about 9 percent were of less than 15 years of age, whereas in the rural areas, 49 percent of the cases were still less than 15 years of age (see Annex Table 12). The prevalence of paralytic poliomyelitis is lower than the rates reported in selected surveys in Niger and Ghana (see Table 14). In both Niger and Ghana, the prevalence is about 0.7 percent, compared to 0.1 percent for rural children of comparable age in China.

Table 14: Comparison of Prevalence of Sequels of Poliomyelitis with Niger and Ghana Surveys

Place	Age		Prevalence %
Niger 1/	5-9		0.69
	10-14		0.57
	5-14		0.64
Danfa (Ghana) 2/	school age		0.72
Ghana 2/	school age		0.82
China 3/	5-9	urban	0.02
		rural	0.10
	10-14	urban	0.08
		rural	0.12

Sources:

1/ Thuriaux, M.C. and B. Getholamy, "Enquete sur la prevalence des sequelles de poliomyelite au niveau des membres inferieurs chez des enfants d'age scolaire dans les zones rurales du Departement de Niamey, Niger", Medecine Tropicale, 42 (1982): 547.

2/ "Comparison of Methods for Estimating the Frequency of Paralytic Poliomyelitis in Developing Countries," Bulletin of the World Health Organization, 57 (1979): 303.

3/ "Survey of Paralytic Sequella of Poliomyelitis," Chinese Journal of Epidemiology, 4 (1983): 142.

A review of the immunization history of detected cases shows that among 4,241 cases, 40 percent occurred after the initiation of mass immunization campaigns. Among these cases, 72 percent had not received vaccination, 3 percent received the full course of vaccination, 5 percent received an incomplete course of vaccination, and 19 percent had an unclear history of vaccination (see Table 15).

Table 15: Recent Distribution of Vaccination History of Cases of Paralytic Poliomyelitis, Changjian, 1981

Vaccination History	Urban Changjian			Rural Changjian		
	North	South	Total	North	South	Total
Not vaccinated	68	57	63	72	86	75
Complete	3	5	4	3	2	3
Incomplete	5	8	6	6	1	5
Unclear	24	30	27	19	11	17

Source: "Report on the Survey of Paralytic Sequella of Poliomyelitis," Chinese Journal of Epidemiology, 4 (1983): 144.

Possible reasons to explain the inapparent protection by vaccine were:

(a) ineffective cold chain, resulting in the loss of vaccine efficacy during transport;

(b) virulence from the live vaccine causing the infection, which is possible in China, although it has not been documented.

(c) Inappropriate use, resulting in the loss of vaccine effectiveness at time of vaccination.

Rubella

Rubella is a common contagious disease of children and young adults. The illness itself is usually mild and self-limited. The real significance of rubella lies in its ability to cause congenital defects in infants of women who acquire rubella during pregnancy. Congenital rubella syndromes include congenital heart disease, cataracts, nerve deafness, and mental retardation.

Rubella infection is universally endemic. Active immunity is acquired by natural infection or by active immunization. Routine rubella

vaccination is not given in China. The incidence of the disease is high in children. A rubella serosurvey conducted in Lanzhou city in 1980 on 1,157 persons of different age groups (see Table 16) and in Beijing in 1980 (see

Table 16: Urban-Rural Comparison of Rubella Seroconversion, Lanzhou, 1980

Age	Urban		Rural	
	No.	% positive	No.	% Positive
1-5	55	70.9	26	80.8
6-10	131	98.5	118	98.3
11-15	141	99.3	59	96.6
16+	352	95.5	211	94.8
Total	679	94.8	414	95.2

Source: Chang, W.Z. et.al., "Serological Survey of Rubella in Lanzhou," Chinese Journal of Epidemiology, 4 (1983): 90.

Table 17) showed that hemaglutination inhibiting antibody level versus rubella was positive in 95 percent of the sample population tested in Lanzhou, and 89 percent of the sample population in Beijing. About 95 percent of the population after 10 years of age are seropositive in both places.

Table 17: Rubella Serosurvey in Beijing, 1980

Age	No. Surveyed	% Positive
less than 1	67	53.7
1-5	183	72.1
6-10	203	91.6
11-15	115	95.5
16-45	391	99.2
Total	959	88.8

Source: Lin, Z.M. et.al., "Serological Survey of Rubella in Beijing," Chinese Journal of Epidemiology, 4 (1983): 32.

About 95 percent of the female population acquire an antibody to rubella by the time they reach childbearing age. Thus, 5 percent of women between ages 21 to 35 are susceptible to rubella infection. An important decision thus needs to be made: to identify and vaccinate susceptible women, and to incorporate the rubella vaccine in the routine vaccination schedule in

order to avoid the risk of rubella infection during early pregnancy (when a mother is capable of infecting the fetus), resulting in congenital defects to the infant.

Diphtheria

Typically manifested as an acute infection of the throat, diphtheria toxin can affect the heart or brain of infants and young children. Death in diphtheria, however, is still mainly due to airway obstruction. The epidemiologic characteristics of the disease has changed concomitant with a marked decrease in incidence since widespread vaccination campaigns.

In 1981, the nationwide incidence was 0.9 per 100,000. In the past few years, no diphtheria cases were reported in 1,040 cities, prefectures, and counties. A review of the characteristics of the reported cases over a 30-year period between 1950 and 1979 in Guandong province showed that 60 to 78 percent of the cases occurred during the months between October and January. The age distribution of patients ranges from 19 days to 37 years of age. Overall, children less than 7 years old accounted for 84 percent of all the cases. However, over the last 10 years, the age distribution of patients has shifted toward older age groups. Between 1974-1975, about 11 percent of cases were of children less than 7 years of age, whereas in the 1950s and 1960s at least 70 percent occurred within the less than 7 year old group. This indicated that immunization has provided protection to an increasing proportion of the younger population which receives routine immunization. The incidence is higher in urban areas, probably due to crowding which increases the risk of exposure to contacts or carriers. Case fatality rates are still higher in rural areas. This is probably due to differences in access to health care between urban and the rural areas. The overall case fatality rate is about 10 percent, which has changed very little for the last 10 years. The virulence of the disease has decreased with widespread immunization campaigns. There are fewer cases of generalized toxemia and relatively more cases of cutaneous diphtheria. There are also possibilities of unapparent infections which may outnumber recognized cases. Cutaneous diphtheria is often indistinguishable from skin infections such as impetigo. Infections are more often localized to nasopharyngeal involvement (90 percent), and much less frequently laryngeal involvement.

Tuberculosis

Tuberculosis was the leading cause of death before liberation, responsible for an estimated 200 to 230 annual deaths per 100,000 population. After liberation, with improvements in living standards (housing and nutrition), immunization, and the availability of chemotherapy, tuberculosis prevalence declined. Tuberculosis mortality by 1979 ranged between 10 to 40 deaths per 100,000 population. In 1980, tuberculosis mortality had dropped to 9th rank among causes of mortality. Bivariate regression analysis seems to indicate that urbanization is associated with a lower prevalence of tuberculosis.

A national tuberculosis morbidity survey was carried out in 1979. The average prevalence of the disease in China was then 717 per 100,000 population. Annex Table 13 and Map shows the tuberculosis prevalence by province. It was estimated from this survey that 2 million patients were actively infectious (i.e., excrete bacillus). Nationwide age-specific morbidity rates are not available; however, reports from some provinces and cities indicate that childhood tuberculosis is still a major concern. The overall prevalence for children less than 7 was estimated to be about 8 percent; the prevalence of pulmonary tuberculosis among primary school children decreased from 1,700 per 100,000 in 1940 to 40 per 100,000. The prevalence for children in middle school declined from 5,400 in 1940 to 200 per 100,000 population in 1979 in Beijing. But the prevalence for middle school children has remained at 200 per 100,000 for the last 10 years. 22/ At present, in many regions in China, the prevalence of pulmonary tuberculosis is highest among the group between 15 to 29 years of age.

In adults, pulmonary tuberculosis is the primary form of infection. The disease takes many forms in children, infecting the bones, kidneys, or brain. Often it may not be recognized as the same disease that affects adults. Distribution of the affected organ in a report on 743 cases of childhood tuberculosis showed that 44 percent were pulmonary, 22 percent extrapulmonary (of which 80 percent were meningitis), and 34 percent were combined pulmonary and extrapulmonary. Among these 743 cases, 85 percent apparently had a history of receiving BCG vaccination.

Meningitis is the major cause of death in childhood tuberculosis. Jiamusi City Tuberculosis Control Center in Heilongjiang Province reported that between 1972 and 1979, about one-third of patients admitted had tuberculosis meningitis. Inner Mongolia Pediatrics Hospital had 74 cases of tuberculosis meningitis between 1978 and 1979, 51 percent of these patients were children less than 2 years of age. Among the tuberculosis patients admitted to a Sichuan Pediatric hospital, 62 percent were less than 5 years of age, 30 percent were between 5 and 10, and 8 percent were between 10 and 12. The prevalence of childhood tuberculosis is about the same for urban and rural populations.

Where the infection rate is high, an effective vaccine could markedly decrease the risk of developing tuberculosis. In China, the level of infection rate is 1.1 percent among young children less than 7 years of age. The level of the infection rate above which vaccination is indicated varies with many factors. Most tuberculosis experts would place this level somewhere between 5.0 and 0.5 new infections per 100 persons per year.

Meningitis is the first component of childhood tuberculosis that will disappear with adequate BCG coverage. Thus, effectiveness of BCG vaccination can be measured by decline or eradication of cases of tuberculosis meningitis. BCG vaccination is a relatively harmless procedure. At present, BCG vaccination is given to all newborns prior to discharge from hospitals, and

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22/ "Summary Discussion on Pediatric Tuberculosis," Chinese Journal of Pediatrics, 20 (1982): 167-71.

re-vaccination is given to children of 7 and 12 years of age, to newly enrolled college students, factory workers, and military recruits. The BCG vaccination campaign started in 1950 and was widely popularized. Shanghai Second Medical College Affiliated Pediatrics Hospital showed that the incidence of tuberculosis meningitis has gradually declined (see Table 18). However, the problem is still not negligible and this is partially due to sub-optimal level of BCG coverage. More than 32 percent of the 1,295,000 persons surveyed in the national tuberculosis sample survey had never received BCG. Also, the effectiveness of BCG vaccination is questionable, since the liquid vaccine produced in China has a validity of only 43 days. Therefore, it is unlikely that all vaccinations throughout China are given with a potent vaccine. Physicians from the Tuberculosis Institute of Heilongjiang Province estimate that about 80 percent of the target population receives the vaccine, of which only 60 to 80 percent are effectively immunized. Consequently, the coverage of the target group is probably lower than 50 percent.

Table 18: Number of Cases of Tuberculosis Meningitis Admitted to Shanghai Second Medical College Affiliated Pediatrics Hospital, 1950-1980

Year	Cases of TB meningitis
1952-55	164
1956-60	194
1961-65	33
1966-70	15
1971-75	8
1976-1980	7
Total 1952-1980	421

Source: "Summary Discussions on Prevention and Management of Pediatric Meningitis," Chinese Journal of Pediatrics, 20 (1980): 170.

Japanese B Encephalitis

This is a mosquito transmitted viral disease which is seen throughout East Asia, including Japan and Korea. Large epidemics were frequently seen near Shanghai City until 1965, with the incidence approximately 54 per 100,000. Since 1965, the incidence in the Shanghai area has been around 2 to 3 per 100,000. From 1974 to 1981 it has ranged between 7 to 12 per 100,000 (see Table 19). Japanese B encephalitis is thought to be present in all of China except Tibet and Xinjiang. Human cases peak at 4-5 years of age; children are at higher risk of clinical infection than young adults. Neurological sequella are noted in as many as 75 percent of survivors, and are more severe in children under 10 years of age. About 80 million doses of inactivated vaccine are produced annually in China. The target population are children between the ages of 5 and 12, with the vaccination schedule being 2

Table 19: Morbidy and Mortality from Japanese B Encephalitis, Nationwide, 1974-1981

	Reported Cases	Deaths	CFR	Incidence per 100,000
1974	98,445	2,899	29	10.8
1975	72,030	422	1	7.8
1976	115,964	4,380	4	12.4
1977	90,149	5,113	6	9.5
1978	107,337	4,313	4	11.2
1979	109,304	4,903	4	11.3
1980	108,774	4,590	4	11.1
1981	67,373	197	0.3	6.8

Source: Data provided by the Ministry of Public Health, October, 1982.

initial doses, 2-3 weeks apart, and a single booster a month later. Since 1979, a booster every four years has been recommended. About 100,000 cases of Japanese B encepahlitis are still reported in China every year. Immunization and control of vector breeding either by application of larvicides or insecticides are available preventive measures of Japanese B encephalitis.

Hepatitis

The change in the prevalence of hepatitis in China is less dramatic than in other countries. A trend of a high prevalence of hepatitis continues. Table 20 reports on the total number of cases registered in China between 1974 and 1981.

Table 20: Morbidity and Mortality from Viral Hepatitis, Nationwide, 1974-1981

	Reported Cases	Deaths	CFR	Incidence per 100,000
1974	241,597	1,276	0.5	26.5
1975	311,547	1,187	0.4	33.7
1976	258,960	1,113	0.4	27.7
1977	264,413	1,121	0.4	27.9
1978	411,312	1,068	0.3	42.9
1979	471,580	1,103	0.2	48.8
1980	474,601	1,153	0.2	48.4
1981	431,016	1,164	0.3	43.5

Source: Data provided by the Ministry of Public Health, October, 1982.

Hepatitis A classically affects almost the entire population during childhood with a demonstrable effect of socioeconomic status and sanitary level on age-specific incidence pattern. The clinical disease in young children is usually mild and the incidence of subclinical infection is high. Infection results in clinical symptoms in 5 to 10 percent of infections only. Outbreaks of hepatitis A occur mainly in children, or collective units in primary and middle schools. The incidence has increased in the recent years due partially to improvements in reporting. However, reports do not usually identify A and B hepatitis and therefore the prevalence of the A form is largely unknown, except for specific surveys.

In contrast to feco-oral transmission of hepatitis A, the mode of hepatitis B transmission is mainly, although not exclusively, parenteral, through inoculation by a contaminated needle, by infective serum or by blood products. Transmission of hepatitis B from carrier mothers to their babies during the perinatal period is an important determinant of the prevalence of the hepatitis B virus (HBV) in some regions. The risk of infection may reach 50 percent. A survey in Henan reported an incidence of 44 percent of such perinatal infections. Frequently, infected people become chronic carriers of HBV, and chronicity is more likely to follow infections acquired in childhood than those acquired in adult life. The highest prevalence of HBV is usually found in children aged 4-8 years, with steadily declining rates among older age groups.

The main epidemiological feature is the association between the HBV infection and the development of primary liver carcinoma. The relative risk of developing liver cancer in HBV carriers as compared to non-carriers is estimated at about 150:1. Liver carcinoma is a fatal disease in almost 100 percent of cases. The coastal plain of China is one of the major world foci of liver carcinoma, responsible for more than 20 annual deaths per 100,000 males in Shanghai municipality, Fujian, Jiangsu, and Zhejiang provinces, and Guangxi Autonomous Region (age-adjusted rates to 1964 census population of China). Therefore, the prevention of hepatitis B through mass immunization in affected areas is a priority for action in southern China.

The prevalence of clinical acute infectious hepatitis was 810 per 100,000 population for children less than 14 years of age in a Beijing survey in 1979. Fourty-four percent of acute hepatitis cases were positive for type A, 20 percent were positive for type B, 22 percent were negative for both (non-A, non-B types), and 14 percent were positive for both type A and B. In Zibo City, Shangdong, 30 percent of patients with acute viral hepatitis were HBV positive. Beijing and Shanghai reported 38 percent and 44 percent, respectively, of hepatitis B among hospitalized hepatitis pediatric patients in 1980. 23/

23/ Yan, Y.G., et. al., "Summary of National Symposium on Prevention and Treatment of Childhood Hepatitis," Chinese Journal of Pediatrics, 20 (May, 1982): 120-123.

The prevalence of HBV in apparently healthy individuals varies from 0.1 to 0.5 percent in North America to as high as 20 percent in Asian and African endemic zones. The prevalence of HBV carriers in Wuhan city for children less than 2 years of age was 22 percent, and 20 percent for children 3 to 6 years of age. In Shanghai City, among children less than 4 years in day care centers surveyed, 30 percent were HBV carriers. In Guizhou province overall, the HBV carrier rate was 6 percent among 1,280 persons surveyed, [24] whereas in Zibo, Shangdong, 12 percent of apparently health individuals were HBV positive. [25]

Prevention of hepatitis B depends on minimizing risk of direct contact with contaminated blood, through testing of donor blood for HBV and proper sterilization of reusable needles or regular examinations of food handlers and day care personnel. Several vaccines are now available in Europe, United States and Japan. China is actively involved in the research on hepatitis B vaccines, and considers mass immunization as a priority for public health. Prevention of hepatitis A is a relatively difficult task, since it depends on improvement of agricultural sanitation and decreased frequency of fecal contamination to water supply and vegetables. Human and animal wastes are heavily utilized for fertilizer production. Environmental pollution is difficult to control until sanitary methods of fertilizer storage, processing and application are applied. In the rural areas, at least 50 percent of the population still uses surface water. Ground water is highly susceptible to fecal contamination when there is no strict standards in sewage disposal.

Epidemic Meningitis

Meningococci are found only in humans. They are spread from the nasopharynx of one person to that of another, probably by respiratory droplets. Transmission is most intense in closed, crowded conditions. Meningococcal disease occurs with a peak in late winter and early spring. Most large epidemics of menigococcal disease are caused by serogroup A.

Table 21 presents the nationwide incidence rate for the period 1974 to 1981. A review of cases for all counties in Xuchang prefecture, Henan province, during 1953-1979 illustrated several epidemiologic characteristics of meningitis. The incidence was highest in February to April in either epidemic or non-epidemic years. A severe epidemic occurred every 8-10 years. The incidence was highest in children of 7 to 15 years of age. The fatality rate was highest among the 0-3 age group. In Xuchang prefecture, the average fatality rate was 9 percent and showed a gradual decline from year to year. The highest fatality rate was 37 percent in 1955, and the lowest was 4

24/ Zheng, Y.H., et. al., "Serological Investigation of Hepatitis B," Chinese Journal of Epidemiology, 2 (1981): 152-155.

25/ Hu, Z.L., et. al., "Epidemiology of Hepatitis in Zibo City," Chinese Journal of Epidemiology, 21 (1981): 243-246.

Table 21: Morbidity and Mortality from Epidemic Meningitis, Nationwide, 1974-1981

	Reported Cases	Deaths	CFR	Incidence per 100,000
1974	30,914	4,996	3.4	16
1975	22,126	3,308	2.4	15
1976	14,861	1,964	1.6	13
1977	13,865	2,027	1.5	15
1978	18,082	2,578	1.9	14
1979	17,437	2,031	1.8	12
1980	14,192	1,793	1.4	13
1981	14,572	1,983	1.5	14

Source: Data provided by the Ministry of Public Health, October, 1982.

percent in 1978. The fatality rate usually does not vary with the rise and fall of the incidence rate. The decrease in the fatality rate is closely associated with improvement of health care and hygienic conditions. In China overall, the fatality rate has been about 15 percent over the last 10 years without marked changes. Table 22 shows the range of incidence between 1953-1979 in Xuchang prefecture.

Table 22: Incidence of Epidemic Meningitis during 1953-1979 in Xuchang, Henan Province

Period	Range	Average
1953-62	0.8 to 33.3 per 100,000	8.4 per 100,000
1963-72	0.8 to 653.0 per 100,000	98.9 per 100,000
1973-79	5.3 to 87.0 per 100,000	29.3 per 100,000

Source: "Epidemiological Analysis of Epidemic Meningitis in Xuchang Prefecture," Chinese Journal of Epidemiology, 1 (February, 1982): 8-11.

Among groups of people, the incidence of the disease is directly related to the carrier rate. A survey of 2,359 persons in Xuchang prefecture indicated that 29 percent of people sampled were meningococcal carriers. The carrier rate in the epidemic region was about 62 percent, and was 13 percent

in the non-epidemic region. The carrier rate of serogroup A in the epidemic region was 26 percent, and that of the non-epidemic region was 1 percent.

Production and efficacy trials of different vaccines have been carried out since 1966 in China. In 1973, a purified vaccine was produced and a five-year trial was carried out which provided a protection rate of 80 percent. However, the vaccine had severe side reactions. Between 1980 and 1981, A4 strain polysaccharide vaccine was used, and the incidence rate of meningitis for the recipient group was 2.20 versus 43.16 for the placebo group. A four-fold rise of antibody was present in 88 percent of the vaccinated group; this was significantly higher than the placebo group (25 percent). This vaccine has been adopted for mass immunization.

IV. NUTRITIONAL STATUS OF CHILDREN

A. Diet and Food Supply

Diet

Human milk offers one of the best ways to close the "protein gap" in the developing world. A major problem encountered today in developing countries is very early weaning or substitution of breast-feeding with cow's milk. In China, both in the cities and in the countryside, breast-feeding is still the "method of choice". At least 90 percent (more in the range of 95-98 percent) of all infants are breastfed today. In urban families, an infant is breastfed for 8-9 months. In rural households, babies are usually breast-fed for at least 18 months. The measures taken by the Chinese health authorities to facilitate breast-feeding are noteworthy. All mothers employed in factories or working for the government are given 2 months maternity leave with pay, in order to allow for breast-feeding. Thereafter, mothers are provided 2 half-hour breaks during their work day to breastfeed their infants. In the rural areas, the daily schedule of nursing mothers is arranged so that they can feed their infants at regular intervals. A more recent study in Shanghai in 1981, however, showed that only 32 percent of infants in urban districts and 74 percent of infants in rural areas are breastfed for 6 months. The trend toward bottle feeding may unfavorably increase as people in the cities adopt it as a sign of westernization. In the cities, majority of the women are engaged in the labor force, hence the grandparents are the primary caretakers of the children. In rural areas, the change from collective to individual or household production may force mothers to give up the choice of breastfeeding in order to increase their time spent in the field for production.

Supplementary feedings begin at six months of age (occasionally earlier), and consists of cereal porridge. Over the following months, pureed vegetables, fruits, and eggs are added. Finely chopped meat, chicken, pork or fish, rice, and noodles are added in the second year.

After two years of age, the children begin to eat a diet which their parents eat. Vitamins are not given to all children regularly. Vitamin A and D are the only ones administered with any frequency, in the form of cod-liver oil capsules by some parents.

Food Supply and Consumption

China's food requirements are enormous. The per capita food energy availability in China changed very little during the period 1959 to 1977 (see Annex Table 14). Based on estimates from aggregate data, China has an adequate level of nutrient availability with respect to requirement. Its per capita daily availability of energy and protein is higher than that of low income countries, and is at a comparable level with many middle income countries (see Table 23). Grains and soya products are the main sources of

Table 23: Comparison of Energy (Calories) and Protein Availability

Country	Per Capita Daily Availability of: Energy		Protein		
	Calories	% of requirement	Total (grams)	% of requirement	% animal and pulse
China, 1979-81	2,531	107	64.9	169	19
Bangladesh	1,812	78	36.0	100	18
Brazil	2,562	107	62.7	161	56
Hong Kong	2,883	126	86.0	257	59
India	2,021	91	50.0	136	26
Indonesia	2,272	105	47.0	130	13
Korea, Rep. of	2,785	119	73.0	183	21
Mexico	2,654	114	66.0	173	41
Nepal	2,002	91	48.0	121	19
Pakistan	2,281	99	63.0	165	32
Sri Lanka	2,126	96	43.0	121	16
Low-income countries	2,052	91	n.a.	n.a.	n.a.
Middle-income countries	2,590	108	n.a.	n.a.	n.a.

Sources: A. Piazza, "Trends in Food and Nutrient Availability in China, 1950-1981," World Bank Staff Working Paper No. 607, 1983.

protein and energy intake (see Table 24). The per capita nutrient availability varies by region. Nutrient availabilities in some provinces of the southwest and northwest regions are lower than the national average. However, the differences are not large (see Annex Tables 15 and 16).

B. Parameters of Child Growth

Children who are well nourished and relatively free of infection grow well. Their physical growth is one of the best indicators of the general health status of children.

Table 24: Nutrient Sources and Availability, 1981

Foodstuffs	Annual per capita consumption (kg)	Daily Per Capita Consumption		
		Food energy (calories)	Protein (grams)	Fats (grams)
Vegetable				
Rice	90.0	902	15.6	2.0
Wheat	52.3	501	16.2	2.2
Other grains	47.7	468	12.0	4.3
Tubers	15.5	212	2.5	0.5
Pulses	6.8	62	4.4	0.2
Vegetable oil	2.6	62	0	7.0
Soya products	4.6	56	4.0	3.2
Sugar	3.8	40	0	0
Vegetables	92.3	66	4.0	0.8
Fruits	5.7	8	0.1	0
Animal				
Pork, beef and mutton	12.1	100	3.9	9.2
Other meat	0.1	1	0.1	0
Poultry	0.9	5	0.4	0.4
Fish	4.3	7	1.2	0.2
Eggs	2.2	8	0.7	0.6
Milk	1.5	2	0.1	0.2
Animal fats	1.0	24	0	2.6
Total	343.0	2,524	65.1	33.4
of which vegetable	320.9	2,377	58.7	20.2
of which animal	22.1	147	6.4	13.2

Source: A. Piazza, "Trends in Food and Nutrient Availability in China, 1950-1981," World Bank Staff Working Paper No. 607, 1983.

International comparisons of the growth of Chinese children have been made with ethnic Chinese children living in Hong Kong and Singapore. The studies show that Chinese infants have, on an average, heights and weights above the North American 58th percentile levels during the first six months of life. In the latter half of the first year of life, they begin to fall behind the North American standards. The mean values in Shanghai do not fall much

below 25th percentile levels, and in the later preschool years they are consistently above that level, both for height and weight. The mean values of Chinese children in Hong Kong and Singapore fall below the 10th percentile levels for weight, and remain there throughout the preschool period (see Figures 4 and 5). 26/ Results of comparison with other countries, such as Nepal, Sri Lanka, Togo, and Liberia, indicate that there is less stunting among suburban Chinese children than among rural children from other countries (see Table 25).

Within China, available data suggest a positive similar change in the growth of children. The improvement, however, is not uniform throughout China. The proportion of stunting in rural children is higher than in urban children (see Annex Tables 17, 18, 19 and 20). Data from 16 provinces in 1979 (see Annex Table 19) showed that about 13 percent of rural 7-year old boys are stunted compared with 3 percent of urban boys. The proportion of stunting in 1979 is less severe than the relatively comparable data of 1975. In 1975, 26 percent of 7 to 8 year old suburban boys and 4 percent of urban boys were stunted. There is a geographical variation in the extent of malnutrition, southern provinces more than northern provinces.

Jamison 27/ reviewed anthropometric data sets from different time periods which included Guangzhou (1952-75); Beijing (1958-80); rural Shanghai (1959-79); 9 cities (1975); and 16 provinces survey (1979). A summary of some of the findings are presented in Table 26. The Z scores represent the number of standard deviations above (+) and below (-) the NCHS median. Again, the data show the urban and rural differences in height and weight. School children in rural Shanghai do better than their counterparts in rural Guangzhou. The rate of increase in height in China for the last 2 decades for 9-year olds was 1.55 cm. per decade in rural Shanghai, 2.49 cm. in Guangzhou City, 1.48 cm. for rural Guangdong, and 3.8 cm. for urban Beijing. Similar data from the 19 provinces of 1979, when compared to 1953-58, indicated an average height increase of 2.3 cm. for males and 2.1 cm. for females per decade for urban children and youths of 7 to 18 years of age, and an increase in weight of 1.35 kg. per decade for males and 0.92 kg. for females.

The rate of growth over the last 25 years was slightly higher than the growth rate of European counterparts, which had an average of 1.5 cm. height increase per decade and 0.5 kg. weight increase per decade. The growth rate, however, was slower than for Japanese counterparts, which had an increase of 3.25 cm. in height per decade for males and 2.93 cm. for females,

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26/ J.D. Wray, "Child Care in the People's Republic of China: 1973," Pediatrics, 55 (1975): 539-550.

27/ D.T. Jamison and F.C. Trowbridge, "The Nutritional Status of Children in China: A Review of the Anthropometric Evidence," Population, Health and Nutrition Technical Notes, GEN 17, World Bank, 1983.

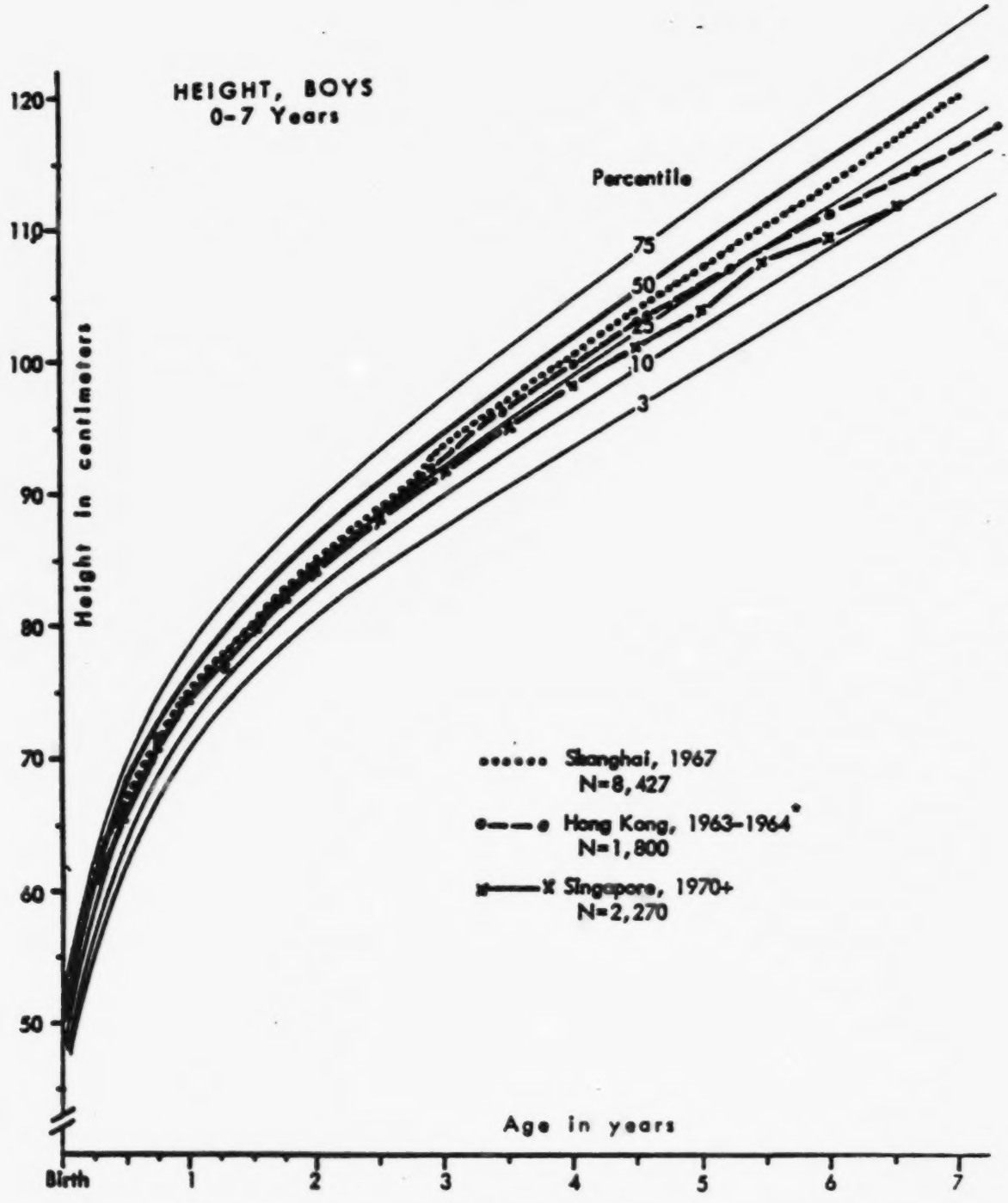

Figure 4. Height of Chinese Boys in Shanghai, Hong Kong, and Singapore from Birth to 7 Years of Age, Plotted against North American Percentile Values

Source: Wray, J.D., "Child Care in the People's Republic of China - 1973: Part II."

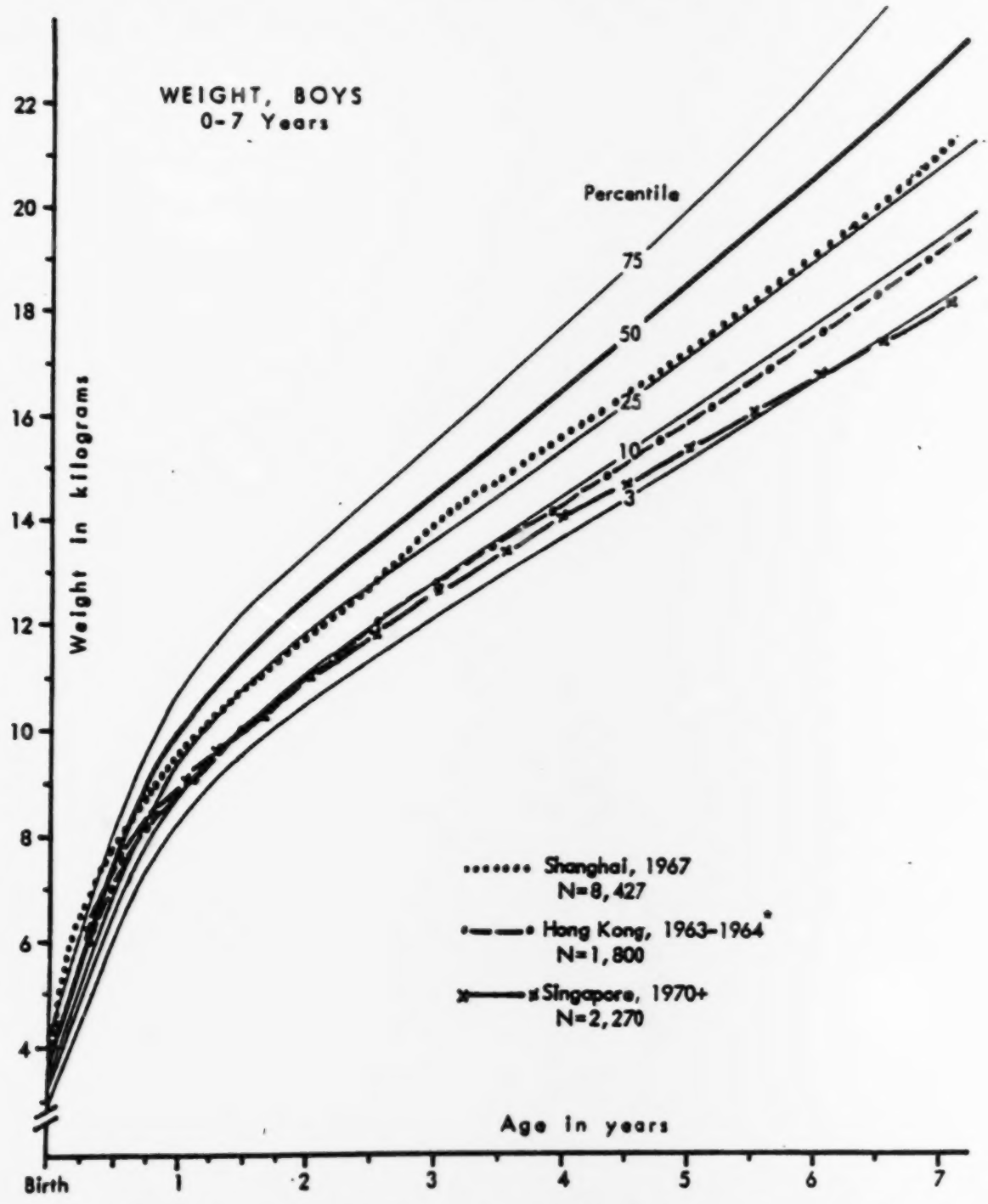

Figure 5. Weight of Chinese Boys in Shanghai, Hong Kong, and Singapore from Birth to 7 Years of Age, Plotted against North American Percentile Values

Source: Wray, J.D., "Child Care in the People's Republic of China - 1973: Part II."

Table 25: Stunting Among Children in China and Selected Other Countries

Location	Percent Stunted		
	Males	Females	Both Sexes
China			
1975 - 9-City Survey, Urban			
Age 3 years	1.8	1.8	1.8
Age 7 years	1.9	1.7	1.8
1975 - 9-City Survey, Suburban			
Age 3 years	12.3	13.6	13.0
Age 7 years	14.9	11.5	13.2
1980 - School Children (age 6-8 years)			
Urban Beijing (N = 136)	0.0	0.0	0.0
Urban Gansu-Lanzhou (N = 29)	0.0	20.0	10.3
Rural Gansu (N = 219)	37.1	23.0	29.2
Urban Jiangsu-Nanjing (N = 80)	0.0	7.3	3.8
Rural Jiangsu (N = 61)	14.3	9.1	11.5
1980 - School Children (age 6-14 years)			
Urban Beijing (N = 530)	0.3	1.6	0.9
Urban Gansu-Lanzhou (N = 154)	5.8	11.8	8.4
Rural Gansu (N = 1,691)	34.1	35.5	34.8
Urban Jiangsu-Nanjing (N = 348)	8.2	11.3	9.8
Rural Jiangsu (N = 426)	25.1	24.1	24.6
Other Countries			
Nepal			
Age 5 years (N = 1,202)			55.4
Age 0-5 years (N = 6,525)			51.9
Sri Lanka			
Age 5 years (N = 2,183)			46.2
Age 0-5 years (N = 13,450)			34.7
Togo			
Age 5 years (N = 700)			24.8
Age 0-5 years (N = 6,094)			19.0
Liberia			
Age 0-5 years (N = 3,377)			18.2

Source: Jamison, D.T. and F.L. Trowbridge, The World Bank, Population, Health and Nutrition Technical Note, No. GEN17, August 1983.

Table 26: Weights and Heights of Schoolchildren in Z-scores [a/], 1952-1980

	Urban Areas				Rural Areas			
	Weight		Height		Weight		Height	
	Male	Female	Male	Female	Male	Female	Male	Female
Guandong (1952)								
7	-1.8		-1.6		-1.8		-2.3	
10	-2.0		-1.9		-2.0		-2.4	
13	-2.0		-1.7		-2.3		-2.6	
Beijing (1958)								
9	-0.8	-1.0	-1.2	-1.1				
12	-1.4	-1.3	-1.6	-2.0				
Shanghai (1959)								
7					-1.6	-1.3	-1.3	-1.7
10					-1.7	-1.8	-1.9	-2.2
13					-1.8	-1.9	-2.0	-2.2
Shanghai (1964)								
7					-1.3	-1.1	-1.6	-1.3
10					-1.5	-1.7	-1.9	-1.9
13					-2.0	-1.8	-2.4	-2.4
Shanghai (1973)								
7					-1.2	-0.7	-0.9	-0.7
10					-1.2	-1.3	-0.8	-1.1
13					-1.5	-1.3	-1.4	-1.5
Beijing (1975)								
9	-0.5	-0.7	-0.0	-0.2				
12	-0.8	-0.7	-0.5	-0.4				
Guangzhan (1975)								
7	-1.1		-0.5		-1.7		-1.6	
10	-1.2		-0.8		-1.5		-1.6	
13	-1.3		-0.9		-1.8		-1.7	
Shanghai (1979)								
7					-0.9	-0.8	-0.7	-0.6
10					-1.1	-1.3	-1.1	-1.0
13					-1.4	-1.3	-1.4	-1.6
Beijing (1980)								
9	0.0	-0.3	0.3	-0.1				
12	-0.4	-0.3	-0.3	-0.1				

a/ Z-scores represent the number of standard deviations above (+) or below (-) the NCHS median.

and an average weight increase of 2.5 kg. for males and 2.03 kg. for females. 28/

In summary, despite the positive secular changes, moderate malnutrition still persists, more in rural than urban areas. The existing data for the rural areas are not representative for the entire rural population; we might expect an even higher prevalence of growth faltering in the more remote rural areas of China. However, the growth attainment achieved in China with the limited nutrient availability is greater in comparison with several developing countries where anthropometric data are available.

C. Micronutrient Deficiency Diseases

A review of nutrition publications to date does not provide additional information on the extent of micronutrient deficiencies in China. It is difficult to measure improvement in specific nutritional diseases. In general, micronutrient deficiency is no longer a major problem in China. There is relatively little vitamin A deficiency, which is commonly associated with protein-energy deficiency disease in many developing countries.

Intake of B vitamins may be low, since their highest concentration is in eggs and meat. However, no data are available on the prevalence of vitamin B deficiency diseases. Lack of vitamin B1 (thiamine) may have become less of a problem after elimination of polished rice. Pellagra (vitamin B6 deficiency) mainly occurs in adults. Prevalence of goiter, which also occurs almost exclusively in adults, has decreased over time with intensive efforts in health education in endemic areas. Local policies, such as the subsidy of production of iodinated salt, and licensing merchants to sell only iodinated salts, have widened the coverage of the population being protected from low iodine intakes.

Anemia

On average, about one-third of Chinese children suffer from anemia. Anemia is a sign, not a disease. Diseases that give rise to anemia in children are primarily malnutrition, malaria, hookworm, congenital defects of hemoglobin, and several other infections. Nutritional anemia, due to lack of nutrients (iron and protein) or loss of iron and protein from the bowel due to hookworm infestation, is still prevalent in China. A 1979 survey of children aged 1 month to 7 years of age in Beijing and Shanxi found 47 percent to be moderately anemic (hemoglobin of 9-12 gram percent) and 2.4 percent to be severely anemic (hemoglobin less than 9 gram percent). A nutritional survey was conducted in urban day care centers and nurseries in Beijing from 1979 to 1980. The percent of children aged 1.5 to 3 years with hemoglobin below 11 gram percent ranged from 10 to 27 percent, and for children aged 3-6 years it

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28/ Research on Physical Shapes, Functions and Qualities of Chinese Children and Youth, Research Group in the Study of the Physique of Chinese Children and Youth, Beijing, 1982.

ranged from 15 to 34 percent (see Annex Table 21). A special survey by staff from the medical college of 45 brigades in Lintong county, Shaanxi province, reported a 27 percent prevalence of anemia in children under 7. In Yangsuo county, Guangxi Autonomous Region, 69 percent of the children under 1 were anemic, and 43 percent of children between 1-2 years and 67 percent of children between 2-3 years had hemoglobin values less than 11 grams percent. A survey conducted in 16 provinces in 1980 showed that overall, 50 percent of children had nutritional anemia. [29/] Important variations exist between regions, between urban and rural areas, and between groups of population with different levels of income.

Rickets - Vitamin D deficiency

Rickets is a chronic nutritional disorder caused by vitamin D deficiency due to failure to expose the skin to the ultraviolet rays of the sun. It generally occurs during the first two years of life when growth is rapid. Rickets is responsible for bowed legs, knock-knees, flat feet and saber legs, and is associated with rachitic rosary and pigeon breast. The deformity of pelvic bones produced by rickets during childhood is one of the causes of difficult labor in pregnant women, and may result in fetal or maternal death.

The overall prevalence rate of rickets in China is not available. In 1979, a sample survey of 10 provinces of over 70,000 children 3 years old and younger found a prevalence of rickets of 29 percent. About 9 percent of children younger than 3 years of age in QiYi Commune, Shanghai County, in annual surveys conducted from 1978 to 1980, was found to have rickets (see Table 27). In Rudong County, Jiangsu province, 30 percent of a sample of 674 children under the age of 7 had rickets. There is a regional difference in the prevalence rate; it is higher in the northern or mountainous regions in high altitudes, where rickets is associated with long winters and shorter hours of daylight. For example, clinical estimates from well-baby clinics of

Table 27: Prevalence of Rickets in QiYi Commune in Children Under Age Three, Shanghai County

Year	Number Examined	Number of Cases	Percent Morbidity
1978	727	106	14.6
1979	698	81	11.6
1980	891	78	8.8

Source: X.J. Hu, X.Y. Zhu, and S.E. Xu, "Child Health Care," American Journal of Public Health, 72 (September, 1982): 37.

29/ Xue, O.B. "Child Health Care Must be Strengthened," National Medical Journal of China, 62 (January, 1982): 1-3.

Huaide County, Jilin province, indicate that 41 percent of children under age 7 had symptoms of rickets in 1982-83.

Rickets has been historically and remains a problem of the northern provinces. Although there is no national policy, in some northern provinces vitamin D supplements, such as cod-liver oil, are given to children during winter months.

Keshan Disease

Keshan disease, a chronic cardiomyopathy which may result from selenium deficiency, has been prevalent in China for more than a hundred years. The disease was named after Keshan county in Heilongjiang province, where the first epidemiologic survey of this disease was carried out in 1935. Since then, cases have been reported from 206 counties located in 14 provinces and autonomous regions. Figure 6 presents the incidence of Keshan disease in Heilongjiang Province between 1955 and 1979, and the overall decline of reported cases in that province.

The disease is distributed in a belt-like zone located between the coastal zone of south eastern China and the inland zone of northwestern China. The affected sites are usually distributed in hilly land, and are seldom seen in high mountains or plains. Ninety-five percent of cases occur in children between 2 and 7 years of age. Figures 7 and 8 indicate the age distribution of cases in children. The prevalence of the disease in endemic areas may reach 1 percent of children under 10 years of age. In recent years, the incidence has sharply decreased to less than 5 per 100,000 from the 3 peak years in 1959, 1964 and 1970, when the incidence was over 40 per 100,000. The case fatality rate has declined from about 5 deaths per 100,000 population in the peak years to less than 1 death per 100,000 population between 1978 to 1980. The alteration of diet to include high selenium food, such as maize and soybean, or sodium selenite supplements have been found to be effective preventive measures.

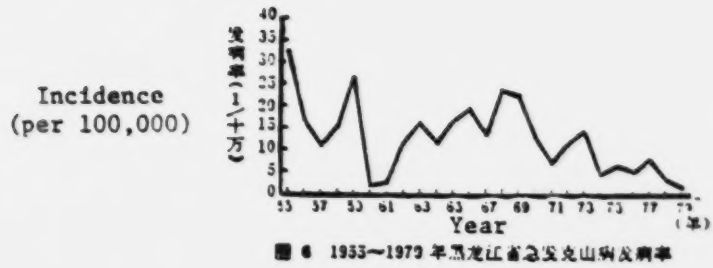

Figure 6. Incidence of Keshan Disease in Heilongjiang, 1955-1979

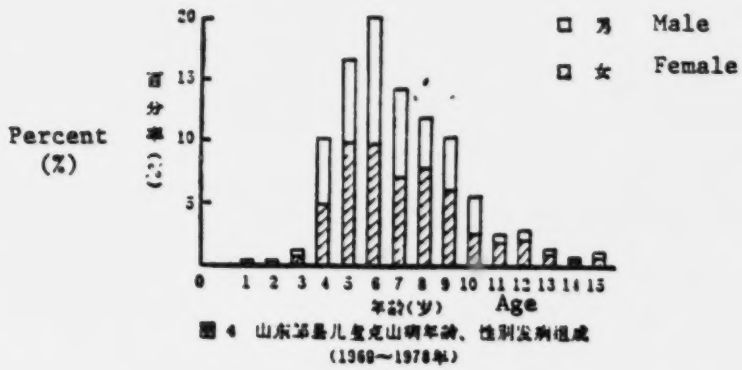

Figure 7. Age Distribution of Cases of Keshan Disease in Tengxian, Shangdong, 1969-1978

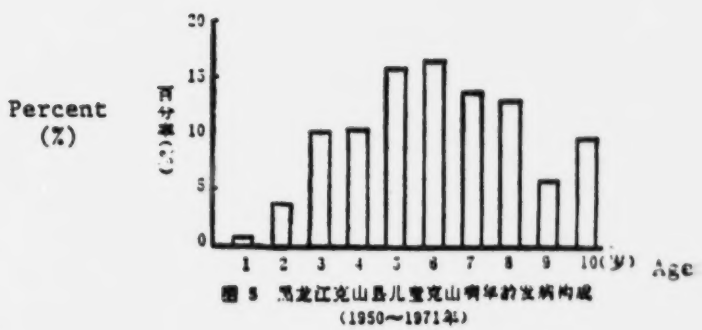

Figure 8. Age Distribution of Cases of Keshan Disease in Keshan County, Heilongjiang, 1950-1971

Source: Su, Y. and Yu, W.H. "Keshan Disease in Children and its Dietary Prevention," National Medical Journal of China, 61 (1981): 642.

V. OTHER CHILDHOOD DISEASES

A. Parasitic Infections

Malaria

In 1953, 11 percent of China's population lived in hyperendemic areas where malaria transmission occurs throughout the year as a result of the presence of all three malaria parasites: P. falciparum, P. vivax, and P. malariae. Fifty percent of the population in China lived in an area where malaria transmission was due to P. vivax, which occurs for six months out of the year, and 32 percent of China's 1953 population lived in areas where malaria is unstable as a result of P. vivax transmission during short periods only. About 8 percent of China's population lived in malaria-free areas. Sample surveys in 1953 reported a 70 percent infection rate among children in Guangdong. An extensive malaria control program was started in 1950 through mass treatment, mass chemoprophylaxis during the transmission period, extensive use of residual indoor insecticide spraying, and control of larval breeding sites. The incidence of malaria since that time has decreased steadily. Between 1950 and 1981, the total number of malaria cases decreased from an estimated 30 million cases to a reported 3 million cases. The number of counties endemic for malaria decreased from 70 percent of the total number of counties to 28 percent. Today, only about 6 percent of the 2,100 counties in China are in high risk areas. In 1979, 30 percent of China's population lived in malaria-free areas, and 35 percent lived in areas where malaria is sporadic (fewer than 5 cases per 10,000 population per year). Twenty-eight percent of China's population lived in areas of moderate risk (between 5 and 100 cases per 10,000 population per year), and 2 percent lived in high malaria risk areas (greater than 100 cases per 10,000). National statistics indicated an overall incidence of about 300 cases per 100,000 population in 1981.

Cases reported from Jiangsu, Shandong, Henan, Anhui and Hubei provinces in 1981 accounted for 86 percent of the total number of cases in China. In these provinces, P. vivax is mostly prevalent and P. falciparum malaria, the only form that causes death, has a diffuse distribution. Age-specific morbidity and mortality figures for malaria in China are difficult to obtain. Mortality from malaria in children is probably limited to southern China in some parts of Guangdong, Guangxi, and Yunnan provinces, and Hainan Island, where falciparum malaria morbidity is still comparatively high and where resistance to chloroquine was recently documented. However, malaria is not an important factor of child mortality, since only 70 deaths due to malaria occurred in China in 1981 among the 3 million reported cases.

Intestinal Parasites

The intestinal worms which are most prevalent and are most debilitating are (i) Ascaris lumbricoides, (ii) Ancylostoma duodenale, and (iii) Trichiuris trichiura. One-third of the entire world population is estimated to be infected by one or more worm species. Ascaris, Ancylostoma and Trichiuris are often associated in the same patient.

The clinical symptoms are usually inapparent; however, the two most damaging symptoms are malnutrition and anemia. Worms excrete toxins (roundworms (ascaris) in particular) which have an inhibiting effect on the digestive enzymes, and hence result in malabsorption syndromes. Ancylostomiasis is cited as a major cause of anemia. The anemia may be further exacerbated by undernutrition. Blood loss caused by any single Ancylostoma worm in an infected person can be as much as 0.67 ml. a day. With average worm loads of Ancylostoma ranging between 50 and 500 worms per infected person, the blood loss can be as high as 300 ml. per day.

Ascaris infection in children retards growth. The percent of dietary calories lost per day due to average Ascaris worm burdens (±7 worms per person) is estimated at 2 to 3 percent. Winfield made an estimate in 1939 30/ on the impact of ascaris infestation on nutrient intake. He estimated that about 336 million people (out of a total population of 400 million) in China were parasitized by 6 billion adult ascarids, which would weight about 24,300 metric tons and would cost about one and a half million pounds sterling annually for food (1939 prices). The cost to the country for treatment of patients, along with the additional indirect cost from loss of work productivity in adults or growth faltering in children as result of decreased nutrition intake, are phenomenal.

The recent documentation on intestinal parasites in China is poor. It does not seem that the disease is a priority for action, nor that surveillance is actively conducted. However, scattered information indicates that the magnitude of the problem probably did not change much since liberation (see Annex Table 22). A recent sample survey in Shaanxi province of 10,000 population showed that 71 percent has Ascaris, 10 percent has Trichiuris, 71 percent has Enterobius vermicularis, and 3 percent has Ancylostoma. Also in Shaanxi, a 1981 survey of 969 children in two schools in rural areas of Lintong county reported an 81 percent infection rate with Ascaris among children aged 7 to 12, and 65 percent among children aged 12 to 14. Another survey of a school sample in Zhangqin county, Shandong Province, showed in 1974 that ascaris was prevalent in 91 percent of children below 9 years of age, with an average number of 37,300 eggs per gram of feces. In Heilongjiang Province, ascaris was present in 37 percent of children in a sample survey in Suihua county in 1981 (personal communication).

Kala Azar

In 1949, there were 650,000 cases of Kala Azar, and the majority of its victims were children. The case fatality rate was about 5 percent. It is now reported that through the use of insecticides, antimony preparations, and the extermination of stray dogs, the disease has been almost completely eliminated. A few cases are still reported from regions where cattle herding is extensively practiced, such as Inner Mongolia and Xinjiang (Sinkiang).

30/ Winfield, G. "Studies on the Control of Fecal-borne Diseases in Northern China: Problems and Methods," Chinese Medical Journal, 51 (1937): 217-36.

B. Endemic Diseases

Endemic Fluorosis

Fluoride is an essential micronutrient. The optimal level of fluoride for drinking water varies with temperature, but the range is usually between 0.5 to 1.0 mg/l. Excess consumption of fluoride in areas where potable water contains a higher concentration may result in fluorosis (mottling of teeth and damage of bone).

Dental fluorosis occurs more frequently in children. Skeletal fluorosis occurs more frequently in adults with chronic exposure to excess fluoride content in drinking water. In China, the northeast and northwest regions and Shangdong Province are the endemic areas. Table 28 gives the result of a survey in 4 counties in Shangdong, which shows an increasing prevalence of dental fluorosis as the concentration of fluoride in drinking water increases. The data did not present the age-specific prevalence rate.

Kaschin-Beck Disease (Osteoarthritis deformans)

The onset of symptoms begins around age of 7, consisting of joint swelling, muscle atrophy, and limb deformity, which may result in stunting in children.

The disease is common among children and adolescents in the areas of northeast, northwest, and north China. The provinces of Shaanxi, Heilongjiang, Gansu, and Sichuan are high incidence sites. A three-year study of Yangzhou County, Shaanxi Province, which has the highest incidence of Kaschin-Beck disease, indicated that the disease may be prevented by replacing a low selenium content maize diet with high selenium content wheat.

Data on the age-specific prevalence rate for the endemic regions are not available. Figures for Heilongjiang show that there are about 600,000 cases concentrated in limited foci. For example, 402 cases are documented in Suihua County (which has a population of 719,000), but all of these cases occur among the 2,063 population of two production brigades.

C. Rheumatic Fever and Rheumatic Heart Disease

The incidence of Rheumatic Fever (RF) has declined markedly in developed countries, in contrast to the continuing high prevalence of the disease in developing countries.

RF is a sequel of pharyngeal infection with group A Streptococcus. RF is rare in children less than four years of age. The peak incidence is age group 4-15, but both primary cases and recurrence cases are frequently seen in adults. The incidence of RF is declining in China. From a survey in Guandong

Table 28. Fluoride Content in Drinking Water and Prevalence of Dental Fluorosis (1979-1980) in Four Counties in Shangdong Province

luoride (mg/l)	GAOMI		JIAXIAN		HUANTAI		FEICHENG		TOTAL	
	# Cases Surveyed	Percent Prevalence	# Cases Surveyed	Percent Prevalence	# Cases Surveyed	Percent Prevalence	# Cases Surveyed	Percent Prevalence	# Cases Surveyed	Percent Prevalence
0.5	64	0	49	6.1	-	-	42	7.1	155	3.9
).5	152	3.9	50	28.0	56	35.7	50	54.0	308	21.8
.01	167	56.3	51	88.2	53	79.2	47	85.1	318	69.5
.01	122	46.4	51	92.2	55	80.0	49	83.7	267	68.9
.01	103	56.3	49	83.7	52	82.7	50	90.0	254	73.6
.01	52	78.8	51	100.0	53	83.0	-	-	156	87.2
.01	53	88.7	49	89.8	55	74.5	-	-	157	84.1
.01	53	88.7	50	98.0	53	88.7	-	-	156	91.7
.01	55	90.9	49	91.8	-	-	-	-	104	91.3
.01	78	76.9	45	88.9	-	-	-	-	123	81.3
.01	50	86.0	50	92.0	-	-	-	-	100	89.0
.01	170	90.0	52	84.6	-	-	-	-	222	88.7

Source: "Survey on the Epidemiology of Endemic Fluorosis in Shangdong Province," Chinese Journal of Preventive Medicine, 6 (1982): 366.

in 1978, the incidence of RF among school children age 6-14 was 81 per 100,000. 31/ Although this is higher than the incidence in the U.S. (3 per 100,000), it is lower than other developing countries such as India (200-1,200 per 100,000). 32/

The signs and symptoms of RF can vary greatly. Clinical manifestations can include varying combinations of polyarthritis, carditis, subcutaneous nodule, erythema marginatum and chorea. Carditis (Rheumatic Heart Disease) is the most debilitating manifestation. Episodes of carditis occurring with recurrent attacks of RF can result in permanent cardiac damage or death. Rheumatic Heart Disease (RHD) is the most common cause of chronic heart disease in children and young adults. It carries significant morbidity. One-fourth of hospitalized cardiac disease cases in the 1970s were still due to RHD, which has declined from 50 percent in the 1950s. The mortality rate of RHD is also high. In Tienjin Children's Hospital the mortality rate of hospitalized children with RHD was 30 percent, of which 75 percent of affected children were less than 15 years of age. 33/

The prevalence rate of RHD reported from several mass surveys vary around 3 per 1000. Between 1976 and 1978, the prevalence rate was 3 per 1000 in Panyu County, Guandong Province (a survey sample of 170,469 farmers of age 15 and over). 34/ A province-wide survey in Guandong (sample of 312,848 people age 15 and over) showed a standardized prevalence rate of 2.89 per 1000. Groups over 45 years of age had a higher prevalence rate, 4 per 1000, and age group 6-18 had the lowest prevalence rate, 1.1 per 1000. 35/

An aggregate prevalence rate was 1.83 per 1000 from a survey of 14 provinces (778,599 persons). The rate was 0.54 per 1000 for children aged 6-14 (sample of 262,317) and 2.48 per 1000 for adults. Southern provinces such as Guandong have a higher prevalence rate than the northern provinces of Jilin and Heilongjiang. 36/

31/ "Survey of Rheumatic Heart Disease and Rheumatic Fever in Guandong Province," (in Chinese) Chinese Journal of Cardiology, 10 (1982): 8-10.

32/ Weatherall, D.J., Oxford Textbook of Medicine, Oxford: Oxford University Press, 1983.

33/ "Report of a Symposium on Rheumatic Heart Disease," (in Chinese), Chinese Journal of Cardiology 10 (1982): 71-73.

34/ "Analysis of Epidemiology of Rheumatic Heart Disease of Natural Masses and Three Years' Follow-up Study in Rural Areas," Lecture in Conference of Epidemiology of Cardiovascular Diseases in China. 1981.

35/ "Survey of Rheumatic Heart Disease and Rheumatic Fever in Guandong Provinces," (in Chinese), Chinese Journal of Cardiology, 10 (1982): 8-10.

36/ "Report of a Symposium on Rheumatic Heart Disease," (in Chinese), Chinese Journal of Cardiology, 10 (1982): 71-73.

The reported decline in the incidence of RF and prevalence of RHD is supported by the fact that there is a shift in the age groups of the affected population. Older age groups have the highest prevalence rates of RHD and active episodes of RF. In the 1950s the peak age group for the prevalence rate of RHD was 20-29; in the 1960s the peak age group was 30-39; and in the 1970s the peak age group shifted to 40-49.

Initial and recurrent attacks of RF are preventable by treatment or prophylaxis of the antecedent streptococcal infection. Accurate diagnosis is required for primary prevention of RF. This is difficult to achieve because streptococcal pharyngitis occurs most frequently in children, who seldom come to medical attention, and in addition one-third or more cases of RF arise after clinical inapparent streptococcal infection.

The most effective strategy for avoiding the mortality and chronic cardiac disability is 'secondary prevention', i.e. focus on persons who already suffered a rheumatic attack and who are susceptible to a recurrence following upper respiratory infection. Antibiotics should be given to all patients who have suffered a documented attack of RF. To ensure patient follow-up for continuing prophylaxis, patient education is important in addition to establishing ongoing service to provide antimicrobial prophylaxis in either the Maternal Child Health or the Epidemic Prevention Station.

VI. MATERNAL AND CHILD HEALTH CARE SERVICES

The Chinese primary health care system operates on three levels: brigade health station, commune health center, and the county hospital (Annex Chart 1). The brigade health station is the base of the pyramid of the three-tier system. Two or three Barefoot Doctors provide care for a population of 1000 to 3000. The commune health centers receive referrals from the brigade health stations and are responsible for technical supervision and training of Barefoot Doctors at the brigade level. At the county level, which is the top of the three-tiered system, there are three health care units: the county hospital, the county epidemic prevention station, and the county maternal and child health station. The county hospital serves as the referral center for the entire county (from approximately 400,000 to 1,300,000 population). The county epidemic prevention station, which is responsible for preventive activities, provides technical support and supervision to the commune health centers. The county maternal and child health station supervises and provides maternal child health activities.

The MCH services are vertically organized from the ministry to the provincial, prefectural, and county levels. The MCH centers are responsible for providing maternal child health care services, including family planning, prenatal and obstetrical care, and surveillance of infants and children. The framework is shown in Figure 9. The distribution of MCH facilities by province in 1982 are set out in Table 29.

A. Maternal Health Care

The Maternal and Child Health service (MCH) is responsible for care for women at all stages of their reproductive cycle, the so-called 5 periods: menstrual, prenatal, intrapartum, postnatal, and menopausal. In 1949, there were only 80 maternal child health centers, with 1,762 beds for all of China (see Table 30). Women in rural areas relied entirely on traditional birth attendants (see Table 31). After liberation, the traditional birth attendants were retrained, in addition to the large increment of health workers trained for MCH services. The number of MCH stations increased 293-fold, and the number of beds in MCH centers increased 8-fold (see Table 30). However, nationwide, the MCH units only account for 1.4 percent of the total health care facilities. There is a wide variation among provinces. Xinjiang has less than half a percent of total health facilities as MCH units. Qinghai has almost 3 percent (see Table 29; Annex Table 23).

At the county level, there is a maternal and child health station whose staff provides guidance, supervision, and administrative support to the maternal health services of the county. For example, Qufu county in Shandong Province (with 0.5 million inhabitants) is staffed by 4 senior physicians, 16 assistant physicians, and 10 mid-level nurses, who perform and organize the MCH activities in the county. The MCH staff organizes and participates in the county-wide screening programs, such as surveys of prevalence of gynecological diseases. In each brigade health station there is a female BFD in charge of

County Public Health Bureau

County Maternal Child Health Services Institute

Commune Health Center
Maternal-Child Division

Brigade Health Station
Barefoot Doctors and/or Midwives

Figure 9. Vertical Organization of Maternal Child Health Services

Table 29: Distribution of Total Health Facilities and Maternal Child Health Care Facilities, by Province, 1982

Province	Total number of health facilities	of which: Maternal-child health facilities	Percent of Total
Nationwide	193,438	2,645	1.4
Beijing	4,389	18	0.4
Tienjin	3,548	19	0.5
Hebei	10,227	178	1.7
Shanxi	5,627	129	2.3
NeiMongol	4,660	121	2.6
Liaoning	7,459	108	1.4
Jilin	4,494	75	1.7
Heilongjiang	9,455	149	1.6
Shanghai	6,445	22	0.3
Jiangsu	10,787	95	0.9
Zhejiang	7,895	73	0.9
Anhui	7,059	114	1.6
Fujian	4,533	31	0.7
Jiangxi	5,615	108	1.9
Shandong	9,830	141	1.4
Henan	8,513	137	1.6
Hubei	6,353	99	1.6
Hunan	10,262	124	1.2
Guangdong	11,990	84	0.7
Guanxi	5,822	88	1.5
Sichuan	18,830	227	1.2
Guizhan	6,595	88	1.3
Yunnan	6,293	147	2.3
Xizhang	958	2	0.2
Shaanxi	6,369	110	1.7
Gansu	3,979	91	2.3
Qinghai	1,208	34	2.8
Ningxia	1,073	21	2.0
Xinjiang	3,170	12	0.4

Source: Statistical Data on National Health Care, 1982, Ministry of Public Health, March, 1983.

Table 30: Maternal Child Health Care Facilities, Beds, and Personnel, Nationwide, 1949-1982

	1949	1957	1965	1975	1980	1982	% Increase 1949-1982
MCH centers - units	80	96	115	103	135	182	1.3
- beds	1,762	6,794	9,233	8,307	11,013	15,446	7.8
Children's hospitals							
units	5	16	28	23	24	24	3.8
beds	139	2,295	4,527	4,546	5,407	5,878	41.3
MCH clinics and stations	9	4,599	2,795	2,025	2,610	2,645	292.9
Western obstetricians and gynecologists	-	4,194	9,218	22,295	-	42,982	-
Western pediatricians	-	4,539	10,281	19,433	-	31,991	-
Midwives	13,900	35,774	45,639	64,875	70,843	73,305	4.3
Part-time midwives	-	657,335	685,740	615,184	634,858	549,659	-

Source: Statistical Data on National Health Care, 1982, Ministry of Public Health, March, 1983.

Table 31: Number of Part-time Health Care Personnel

	1970	1975	1980	1982
Barefoot doctors	1,218,266	1,559,214	1,463,406	1,348,784
of which female	-	502,225	489,422	409,792
% female	-	32.2	33.4	30.4
Rural midwives	-	615,184	634,858	549,659

Source: Statistical Data on National Health Care, 1982, Ministry of Public Health, March, 1983.

MCH. Prenatal services are provided to pregnant women once the pregnancy is diagnosed. The BFDs provide most of the routine prenatal care, such as measurement of blood pressure. Some pregnant women go to the commune health centers for check-ups. Pregnant women who develop complications such as hypertension or oedema, or have a family history of congenital defects are referred to the county level MCH centers. The quality of care, as measured by reported complications rates, has steadily improved. The frequency of postpartum hemorrhage and infections have declined.

The coverage of midwives per population increased from 26,705 population per midwife to 13,828 per midwife, between 1952 and 1980. Nowadays, there is nearly complete coverage of deliveries by hospital or by rural birth attendants. Over 90 percent of deliveries are performed by the so-called "scientific method," i.e. using sterile instruments. On the average, there are 1.4 barefoot doctors per 1,000 rural population. As a result of increased access to health services, the incidence of neonatal tetanus and postpartum infection have drastically declined.

Besides antenatal care, the BFDs and health personnels in the commune health centers and county MCH centers also provide postpartum care. The BFDs provide home visits to the mother and the infants within one week after discharge from the hospital. Gynecological services, such as treatment of common gynecological diseases, are provided in the commune and county MCH centers. Screening for gynecological diseases, such as cervicitis and cervical cancer, are conducted every two to three years. Women who have cervicitis, salpingitis, or vaginitis are treated. Those diagnosed with possible malignancy are referred to either commune or county level for further work-up. In Qufu county (Shandong Province), for example, the MCH health centers carry out systematic examination of all married women below 60 years of age every three years. The most common diseases are cervicitis, salpingitis, and menstrual disorders. The prevalence of these disorders among women in Qufu county was abut 20 percent. Contraceptives are dispensed at all levels of the health care system. Intrauterine devices are inserted at the commune hospitals or higher level medical centers. However, in some areas the BFDs are also trained to insert IUDs. Abortions are perfomed at the commune health centers or county level MCH health centers.

A survey in 12 provinces reflected a steady increase in the percentage of births delivered by C-sections in recent years. The rate of C-sections ranges from 7 to 38 percent. The reasons attributed to the increase are (i) an increased proportion of primid gravidas, which in general have a higher prevalence of difficult deliveries, (ii) an increased frequency of intrapartum monitoring, resulting in earlier diagnosis of fetal distress, (iii) a relaxing of criteria for C-sections by health personnel under the one child family policy aimed at improving pregnancy outcome, and (iv) the demand by families for C-sections in order to decrease the risks associated with vaginal deliveries. In certain areas, the rate of C-section deliveries increased from 7 percent in 1976 to 29 percent in 1981. The associated maternal risks of C-sections are many, including bleeding, wound infection, and chronic endometritis. Thus, even under the pressure to optimize pregnancy

outcome, the criteria for C-sections should be strictly medical, rather than letting socially related factors influence medical decisions.

B. Child Health Care

In 1949, China had only 5 children's hospitals, all in the urban cities, with a total of 139 beds. In 1980, there were 24 specialized children's hospitals with 5,407 beds, located in 18 of the 29 provinces, autonomous regions and municipalities. Annex Table 23 presents the distribution of children's hospitals by province. There is great inter-provincial variation, with 11 provinces and regions lacking this type of facility. However, many general hospitals encompass pediatrics departments and the availability of beds for child care exceeds by large the capacity of specialized children's facilities.

Since 1949, a 3-level child health care service network, in conjuction with maternal health care, has been entensively developed. Child health services, which include home visits for care of newborns, routine physical examinations, mass screening of school age children, supervision of nurseries and kindergartens, and routine immunization, are carried out by health staff from all three levels, that is, (i) barefoot doctors, (ii) health personnel at the commune health centers who carry out activities under the supervision and guidance of staff from the county MCH centers, and (iii) pediatric staff from the county hospitals. The immunization services are usually done in collaboration with the county and commune epidemic prevention stations. The staff from the epidemic prevention station plan and organize the logistics for vaccine distribution. The BFDs and MCH staff are responsible for identifying the target group and giving the vaccination.

Children in China have easy access to health care services. In 1982, there were 31,991 Western trained pediatricians, 24 major pediatrics hospitals, and 18,091 MCH centers and clinics for the 339 million children under age 14. There is, however, a lack of integration of services. Curative services for children at different ages are provided by BFDs and health staff in commune health centers and county hospitals. Preventive services, such as growth monitoring of a well baby, mass surveys of school age children, and immunizations, are provided by the staff from maternal child health care centers and epidemic prevention stations. It is only at the brigade level that the services are integrated and continuity of care is provided.

There are very little data on the assessment of the quality of staff. Coverage of immunization has attained a rate over 90 percent. However, efficacy of the vaccinations is handicapped by the poor quality of vaccines. From the available verification reports on immunization against preventable diseases, lack of knowledge of vaccine handling was still a common reason for patients contracting the disease despite having received the vaccination. A study of barefoot doctors' practice showed that there is heavy use of antibiotics for treatment of illnesses, such as common cold and acute gastroenteritis. In 335 cases of common cold, BFDs prescribed an average of 1.6 drugs per patient: 32 percent of the cases received antibiotics, 52 percent received traditional Chinese medicine, and 74 percent received an analgesic or antipyretic. Of the 108 patients who received antibiotics, 10

percent received kanamycin, 20 percent received gentamycin, 48 percent received tetracycline, 20 percent received penicillin, and 6 percent received sulfamethaxazole. 37/

For children affected with respiratory disease, timely use of penicillin is crucial to the reduction of morbidity from complications of pneumonia. However, casual use of antibiotics without appropriate indication on the severity of the illness may lead to the appearance of drug-resistant organisms.

37/ Young, M. "Study of Barefoot Doctors' Activities in China," Johns Hopkins School of Public Health and Hygiene, thesis for Dr.P.H., March, 1984.

VII. ISSUES

China over the last 30 years has established a sound infrastructure of maternal child health services. Under limited resources, it made a firm commitment to emphasize preventive health services, such as immunization against childhood communicable diseases, and prenatal, intrapartum, and postnatal services. In our review of the pattern of child mortality, we notice that the trend in infant mortality is steadily decreasing. As changes in the infant mortality rate are closely associated with the general economic development of the population, we observe that China's accomplishment has exceeded any expected level of improvement in health, considering its present level of economic development.

The overall pattern of mortality in China is undergoing a gradual transition: the percentage of total deaths secondary to chronic diseases, such as cardiovascular disease and cancers, are increasing in the urbanized areas, and the percentage of total deaths secondary to infectious, parasitic diseases, although they still persist, are decreasing. Similarly, the mortality reduction is also observed among children. About two-thirds of infant deaths now occur during the neonatal period. The prevalence of chronic disease, such as congenital defects, is rising, although the magnitude of the problem is not comparable to the impact of respiratory diseases. The morbidity pattern, however, is still mainly due to infectious diseases.

The improvement attained in child health care has been remarkable; however, these achievements are not satisfactory under the one child per family policy. The "one child is best" norm was approved by the State Council and formally endorsed in 1978 by the Central Committee of the Chinese Communist Party. The one child campaign was launched in early 1979. The call in 1979 for the "one child per family" was an attempt to avoid the potential resurgence of a second baby boom. The cohort of the "baby boom" of the late 1960s is now entering childbearing ages. The increase in the absolute numbers of couples as a result of the first baby boom would lead to a significant increase in the population, even with a population policy of two children per couple.

A. The One Child Family Policy

A major issue in child health care stems from the consequences of the one child family policy. Premier Hua Guofeng stated "The State demands that each couple should ideally have only one child and not more than two. To produce a third child is to violate the state regulations." 38/ There are varied incentives and disincentives to encourage couples of child-bearing age to pledge to have only one child. As an incentive, couples who sign the "one child certificate" are entitled to benefits in health care, housing, food

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38/ Hua Guofeng. Report to the Second Session of National People's Congress, Beijing, June 18, 1979.

allowances, and work assignments. The disincentives for couples who have more than two children also vary from place to place. For example, in some areas the medical care cost of the first child is free (paid for by the state or the parent's workplace), and the medical care cost of any child beyond two children must be paid by the parents. Another form of disincentive is through restricting the number of children from a single family who can attend university simultaneously. Annex table 24 summarizes the incentives and the disincentives used in China's population strategy.

The intensive campaign for population limitation in China is directed to the ethnic Chinese population, the Han people, who comprise 94 percent of the population (about 937 million people). The remaining 66 million people are 'national minorities'. For these minority groups the population policy is different. The policy encourages population increase; however, family planning is provided to those who want to limit the number of their children.

Better health as part of an improved population policy has become important with the one child family program. Couples restricted to one child want and need extra reassurance that the child will be healthy. Guaranteeing healthy babies implies a need to improve prenatal as well as postnatal care. There is strong pressure at the county level to establish genetic screening services for early identification of congenital defects, in order to reassure the quality of the pregnancy outcome. Prenatal diagnosis and screening programmes at birth for treatable or preventable diseases become, therefore, essential components of maternal and child care services.

The state of the fetus can be directly assessed from an anatomical viewpoint by ultrasonography, and at the cellular level by examining the amniotic fluid by biochemical and cytological techniques. An amniocentesis for the diagnosis of chromosomal and inherited biochemical abnormalities is ideally undertaken during the sixteenth week of pregnancy, because the volume of fluid is then sufficiently large to reduce the risk of inducing the miscarriage of a normal fetus to about 1 percent. Amniotic fluid should be examined for diagnosis of inborn error of metabolism, for alpha-fetoprotein in order to diagnose an unsuspected open neural tube defect, and for chromosomal abnormalities. It should be aimed at a selective population which is at high risk for certain diseases based on genetic, geographical and clinical grounds.

In many county level MCH centers, the health staff, under the increased demands of the community for eugenics screening, is attempting to set up genetics laboratories. With limited resources, uniform quality standards are difficult to achieve. Chromosomal mapping, cell culture, and detailed biochemical analysis techniques require advanced technical training and sophisticated laboratory tools. Such services can be most efficiently utilized if established at prefectural or provincial level, and if high-risk couples with family histories of congenital defects are referred from the counties for genetic screening at the regional centers. To divert the time of the health staff in the county MCH centers from direct patient care to laboratory analysis would be inefficient and non-efficacious.

Similarly, improved screening for perinatal risks is needed. There is a need to use standard fetal monitoring to assist in the early detection of fetal distress and for timely management of high-risk infants. In order to reduce perinatal mortality, regular prenatal care should begin early in pregnancy. In the urban areas, prenatal care begins at 3 to 6 months of pregnancy, and the woman is examined once a month. After 7 months of pregnancy, she is examined every two weeks. In the rural areas, basic knowledge about prenatal care is becoming more widespread, and increasingly more pregnant women begin their care as soon as the pregnancy is confirmed. Most of the prenatal care is provided by BFDs; some pregnant women go to the commune health center for care.

Pregnant women with high-risk conditions, such as eclampsia or intrauterine growth retardation, can be referred to the county level health care facilities for closer monitoring and prompt obstetrical management in collaboration with assistance from the pediatric staff who will provide care to the high-risk neonate.

Extrauterine monitoring of the fetal heart rate can diagnose conditions leading to fetal distress such as placental insufficiency, nuchal umbilical cord, or prolapse of the umbilical cord. However, training of health staff is required to ensure competent interpretation of the diagnostic findings.

Comprehensiveness of prenatal care activities may vary according to urban and rural conditions. The rural areas, based on the limitations of their resources, may aim to (a) strengthen health education on potential consequences of consanguineous marriage, benefits of prenatal care, and proper maternal dietary intakes; (b) strengthen outreach services to increase the coverage of prenatal care to pregnant women; and (c) increase coverage of 'scientific' deliveries. In Heilongjiang, the requirements of a 'scientific' delivery are to monitor stages of the labor, to use sterile tools and gloves, and to apply mercurichrome on the perineal area prior to delivery. Although in China the overall rate of 'scientific' delivery is over 90 percent, there is still a wide variation in rural areas. Many factors, such as different cultural practices among the national minorities, home deliveries, inadequate training of midwives or birth attendants, and lack of sterile tools, all contribute to the relatively higher maternal and neonatal morbidity rates in rural areas, especially in geographically remote or in poorer socioeconomic regions.

There is also a need to strengthen neonatal care and to establish a high-risk neonatal transfer transport system. The perinatal mortality rate ranges from 9.3 to 122.5 deaths per 1,000 live births. Such a wide variation may be due to difference in reporting; however, they also reflect urban-rural differences in quality of health facilities. The best single indicator of the quality of perinatal care may be the risk of death among the heavier

infants. The rate is higher in Shanghai than the rate in California. 39/ The county health centers lack equipment and staff to adequately manage high-risk infants. There is a need for monitoring and resuscitation of high-risk neonates during transport from local health centers to a regional health facility which is equipped with an intensive care unit.

China has put her priorities in the past on prevention, with curative medical care universally available but basic. China has established a well-developed health care infrastructure; her next major task, especially under the one child policy, is to improve the sophistication in the technology of perinatal care, such as updating equipment and facilities for resuscitation and intensive care of sick infants. The rural counties have simple incubators, but more complex equipment is notably absent.

B. Integration of MCH Services

The lack of integration of curative and preventive services for mothers and children is another major issue. Under the three-tiered health care system, the obstetrics and gynecology and the pediatrics departments of the county general hospitals offer curative services. The county epidemic prevention station organizes immunization activities, and the county MCH station provides a mixture of preventive and curative services. As a result of this fragmentation, there is a duplication of services. MCH services at the county level provide obstetrical services in addition to preventive services such as prenatal care and well baby care. Therefore, MCH services increasingly duplicate curative services already available in the county hospital. This emphasis on curative activities inevitably reduces the MCH's allocation of financial and manpower resources for preventive services, and do not improve the quality of services available to the population.

Furthermore, there is a possibility that the BFDs may abandon the preventive aspects of the MCH services. Before the introduction of the responsibility system, rural basic health care was mainly financed out of the collective welfare fund; at present, services are provided on a fee-for-service basis. Because preventive services yield few immediate results as compared to curative care, patients may be reluctant to pay for them, and BFDs may become less willing to provide these services because the monetary return is low, relative to curative services. The BFDs' activities in Qufu county, Shandong Province, were measured quantitatively with work study techniques in 1982. 40/ The results indicated that on a daily average, a BFD spent only 3 percent of his time, out of a six-hour observational period, on preventive

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39/ Wegman, M.E. "Addendum: Some First Hand Observations", in M.E. Wegman, et.al. (eds.), Public Health in the PROC, New York: Mosiah Macy Jr. Foundation, 1973: 273-81.

40/ Young, M. "Study of Barefoot Doctors' Activities in China," Johns Hopkins University, Baltimore, thesis for Dr. P.H., 1984.

activities. Only 5 minutes were devoted to maternal child care and family planning.

The administrative organization of family planning services is branching off to become a new, independent vertical structure. This trend directly results from the promotion of the State Family Planning Commission in 1983 to a ministerial level authority, which indicates the high priority that is given by the State Council to the tasks of the population program. This new situation calls for the creation of independent delivery services under direct line authority. The Birth Planning Commission of the State Council sets population policies. The commission is backed up by the State Birth Planning Office, which supervises activities throughout the country. At the provincial level, a birth plannning committee sets implementation plans and organizes mass media campaigns. At the county level, county birth planning offices supply contraceptives to the rural communes and production brigades. There is also a birth planning leadership group at the commune level, and another at the brigade level, that supervises the BFDs who deliver contraceptives to brigade members. It is only at the brigade level that services are fully integrated. The separation of a different administrative hierarchy for family planning services, in addition to MCH services, duplicates many activities provided by health personnel. The resultant lack of continuity of care reduces the efficiency and efficacy of the services offered.

There is a need to coordinate the existing fragmented services for mothers and children which are now provided from various sources: the county MCH center, the epidemic prevention station, the county hospital (pediatric, obstetrical, and gynecological departments), and the county birth planning office. The efficacy of these services could be greatly enhanced if they could be organized under one leading group with the responsibility of maintaining a balance of curative and preventive services provided by the different organizations.

C. Improvement of Immunization Coverage

A third major issue is the improvement of immunization coverage. A very high percentage of children are being immunized, and a sharp decrease in the incidence of communicable diseases is the best evidence for the tremendous administrative and manpower efforts dedicated to the immunization activities. Problems, however, do still exist. Remarkable efforts in the organization of mass campaigns, and prompt delivery of vaccines, have been invested to compensate for an inadequate cold chain system. However, the production of good quality vaccines is just as important as the issue of vaccine storage and transport, and the logistics of giving the vaccines to the target population.

There are five important issues in immunization activities. First, the production of vaccines is ineffective and outdated. Measles and BCG are not available in freeze-dried form. The liquid product has a short potency duration (43 days), as compared with 2 years of the freeze-dried products. The equipment for vaccine production needs to be improved to reach

international standards. There is a need for freeze drying equipment to enhance the life span of vaccine products now produced in China. There is a need for quality control during production to ensure safety of the vaccines, both in terms of avoiding contamination by microorganisms and in ensuring proper attenuation of live viruses; and there is also a need for improvement of the packaging of the final product form. For example, polio vaccine is presently encapsulated in candies, which are bulky and difficult to transport in ice boxes.

Second, wastage is enormous. Recent surveys estimate that the wastage ratio is 2.5 to 3, which means that the amount of vaccine ordered is 3 times the number of actual planned doses. Some reasons for wastage are short duration of vaccine potency, poor cold chain, and inadequate product packaging. Vaccines are packaged in large vials (100 or more doses per vial), which inevitably leads to wastage in the decentralized delivery system. Vaccines could be optimally utilized if smaller vials (5 to 10 doses per vial) were distributed to the brigades, since the number of recipients per brigade is small.

Third, the immunization schedules are inadequate. In general, mass vaccination campaigns are organized once a year. Those children who do not reach the eligible age at the time of the vaccination, or who are ill at the time of the campaign, or are absent for other reasons, will not receive the vaccination, and hence are susceptible to contracting the disease. For measles vaccination the annual interval is not desirable. A high proportion of infants who are too young at the time of the annual vaccination campaign will be at high risk, susceptible to contracting the infection before the next vaccination campaign. In order to further reduce morbidity, a more frequent vaccination schedule, such as quarterly campaigns, would be required to improve the coverage of infants and to reach the target group of infants of 9 to 12 month of age.

Fourth, cold chain equipment is inadequate. There is a lack of equipment for a more effective cold chain, such as refrigerators, cold boxes, and vaccine temperature-monitoring devices. The problem of the cold chain is evidenced by the continuing high prevalence of diseases such as measles, despite high reported immunization coverage. Temperature monitoring is crucial during transport and storage of the vaccines.

Fifth, the development of a recording, reporting, and feedback system for immunization activities, and morbidity and mortality data is needed.

Training of personnel, such as those individuals involved in administering vaccines, maintaining the cold chain, or driving a vehicle for vaccine transport, and training of a new generation of technical staff in vaccine production and quality control are crucial to enhance further improvement in the outcome of the immunization activities.

D. Additional Training

There is a need to strengthen the technical skills of MCH staff at all levels. Appropriate diagnosis and management of illnesses is crucial to reducing morbidity and mortality. For example, pneumonia accounts for one-third of the causes of child morbidity. Childhood respiratory infections are mainly of viral etiology. However, complications with the development of bacterial pneumonia carry high fatality rates, especially in infants. The BFDs and the health staff at the commune level must be trained to recognize the severity of illnesses, and to be aware of indications for timely referral of patients to a higher level. Decision trees or flow charts are crucial in assisting BFDs to manage prevalent illnesses such as respiratory infections.

Under the one child family policy, emphasis is placed on optimizing pregnancy outcome, and fetal monitoring can assist the early recognition of fetal distress. However, training of health staff to appropriately recognize signs of fetal distress is crucial to avoid the overzealous performance of invasive procedures such as C-section deliveries, which is a procedure not totally risk free.

E. Closing Network Service Gaps

There is also a need to fill the service gaps present in the health care network. There is no routine monitoring of growth and development. Special nutritional surveys indicate that moderate malnutrition still persists in China; however, monitoring of the nutritional status of children is not routinely performed. Early diagnosis of growth faltering and management of failure-to-thrive infants is crucial to maximize the full growth potential of each child. The BFDs should be trained to regularly weigh infants and to use weight charts for each child. At present, annual height and weight records are kept in the brigade health stations. However, the practice of recording weight and height is often a self-limited exercise. Actions are not taken to identify growth faltering in individual children. Assessments of children's development are seldom performed by the primary level health workers. This activity has been emphasized only since the launch of the one child policy. The basic techniques in development screening should be incorporated into the training curriculum of health workers to enable them to provide early identification of children with developmental delays and problems, and to refer them for more professional assessment.

There is a decreasing emphasis on sanitation services. The current emphasis on improving quality of services applies largely to curative care. In the past 30 years, through community mobilization, a major effort has been placed on improvement of environmental hygiene. There has been drastic improvement in general sanitation . However, the emphasis seems not to have been maintained recently. The BFDs are spending only a very small proportion of their time on preventive activities. There is no longer a full-time staff at the commune health stations with responsibilities for sanitation. Environmental and water pollution are the key contributing factors to fecal-borne diseases, such as dysentery, ascaris, hookworm, and hepatitis, which are still major health problems in China. With the introduction of the

responsibility system, individual households may intensify their use of human excreta as fertilizers. Concurrently, as the collective agricultural system collapses after the introduction of the responsibility system, the communal sanitation system for collection, conservation, and composting of excreta may also be collapsing. This may lead to a worsening of environmental pollution, which in turn may lead to higher prevalence of fecal-borne diseases. Public health officials need to allocate special resources to maintain environmental sanitation. Regular inspections of water should be strengthened . Health education should also be strengthened to increase the awareness of the peasants of agricultural sanitation.

F. The Reporting System

Another major issue is the strengthening of the reporting and surveillance system. The prospects for complete notification of diseases are excellent, since the organization of health services enables a complete coverage of the population, both rural and urban areas. Existing literature to date indicate that many surveys have been conducted by health institutions on the morbidity and mortality pattern of children; however, there is no indication on the representativeness of the population from the sample surveyed. Underreporting is a significant problem in the data on mortality and morbidity. There is a wide variation in the extent of underreporting from province to province. Poor validity in reporting is inevitable, since standardized case definitions have not been developed, and there is no evidence of a manual outlining surveillance and investigation procedures. In order to improve the validity and the quality of the data, there is a great need for training of those health staff at all levels who are involved in the reporting of deaths and diseases.

G. Continuing Presence of Malnutrition

The final issue is the strengthening of strategies to address the continuing presence of malnutrition. The assessment of the nutritional status of children is the ultimate test of health and food policies.

Secular improvement in anthropometric status is noted, even though the caloric availability per capita in China increased by only about 1 percent between 1957 and 1977. The key contributing factors were the elimination of maldistribution of food and the health sector's promotion of a preventive approach to diseases. China's agriculture has progressed from mobilization of labor for increased production to increased use of fertilizer to mechanization. To ensure adequate dietary energy intake, efforts to increase production is complemented by a careful control on consumption, that is, equitable rationing, a process which has improved distribution and minimized food wastage.

The effectiveness of the health care system in contributing to the improvement of nutrition is largely the result of its accessibility and an emphasis on prevention: sanitation, immunization, and prenatal and postnatal care. There has been a steady secular improvement in the nutritional status of children in China. A comparison of the growth of Chinese children with

that of other developinng countries (such as Nepal, Sri Lanka, Togo, and Liberia) also showed that the rates of stunting in China are lower.

The results of various nutritional assessments, however, indicate that there remains a substantial amount of mild to moderate malnutrition. Furthermore, there are distinct regional and urban-rural differences in the extent of malnutrition.

Comprehensive surveys that link the anthropometric status of a child with his food consumption are not available in China. The results of a nutritional survey in urban nurseries in Beijing showed that the nutritional quality of the diet provided by these institutions seemed to be reasonable, since 13 percent of the total caloric intake was from protein and 25 percent of the total intake was from fat. The amount of animal and legume protein was about 55 percent of the total protein intake. However, the intake of calories and protein was only about 62 percent of the standard quantity provided. The intake of micronutrients was also below standards; calcium was about 34 percent, vitamin A was 59 percent, and vitamin C was 58 percent. 41/

Although acute signs of protein deficiency (such as kwashiorkor) are not observed, there may be a substantial degree of subclinical protein deficiency. This is supported by observation of a high prevalence of anemia among children.

Over the last 30 years, China has addressed aggressively the key issue of coverage, both in terms of food distribution and accessibility of health services. In addition to maintaining its political commitment to nutritional issues, the government needs to respond to the findings of the nutritional surveys by setting up corrective programs. It is not possible, however, to make recommendations with regard to the types of corrective programs that are needed without analyzing the underlying reasons. Malnutrition can be caused by many factors, some of them synergistic. The high prevalence of parasitism, acute respiratory or gastrointestinal infections, and dysfunction in family dynamics (an emerging problem as a result of the 'one child norm'), are only a few possible contributing factors.

Improving the quality of nutrient intake, strengthening health surveillance, early detection of those at risk, and active diagnosis and treatment of malnourished children, all deserve to be high priority components of the health care service delivery system. Maximizing a child's growth is the most effective way to reassure the family and the society. A child that grows well closely determines the acceptance and the viability of the present one child family policy.

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Liu, D.S., et.al., "Nutritional Survey in Urban Nurseries and Kindergartens of Beijing During 1979-1980," National Medical Journal of China, 61 (1981): 585-590.

Liu, W.W., et.al., "An Analysis of Diseases of the Newborn," (in Chinese), Chinese Journal of Obstetrics and Gynecology, 14 (October, 1979): 303-305.

Prevalence of morbidity among newborns between 1973 and 1977. Peak prevalence occurs during September, the hottest month of the year. Communicable diseases still account for 31 percent of morbidity; birth injury, 14 percent; congenital defects, 8 percent; hematological system, 6 percent; respiratory disease, 5 percent; digestive system, 4 percent; and other, 33 percent.

Liu, X.Y., and Zhao, H.X., "Investigation on Immunity Level Against Measles in Nanguan, Changchun," (in Chinese), Chinese Journal of Epidemiology, 4 (1983): 176-177.

All 364 children of ages 2 to 15 were found to be positive for measles antibody. Revaccination of those who pre-vaccination antibody titer was less than 1:16 resulted in an increase of antibody in 33 percent of the recipients.

Mao, W.H., "Clinical Features of Tuberculosis and Early Diagnosis in Infants," Chinese Journal of Pediatrics, 20 (August, 1982): 150-152.

Mark, C.E., et.al., "Birthweight Distribution of Singapore Chinese, Malay and Indian Infants From 34 Weeks to 42 Weeks Gestation," The Journal of Obstetrics and Gynecology, 79 (February, 1972): 149-153.

Meng, O.W., "Epidemiologic Characteristics of Diphtheria in Guandong Over the Last 30 Years," (in Chinese), Chinese Journal of Epidemiology, 2 (1981): 170-172.

The article reviewed the clinical features of diphtheria cases, changes in incidence rate, age, and urban/rural distribution.

Ofosu-Amaah, S., Kratzer, J., and Nicholas, D., "Is Poliomyelitis a Serious Problem in Developing Countries? - Lameness in Ghanaian Schools," British Medical Journal, 1 (1977): 1012-1014.

Estimated annual incidence of paralytic poliomyelitis was 23 per 100,000 population, official reported incidence rate ranged from 0.1 to 2.1 per 100,000 population. The estimated prevalence of lameness attributable to poliomyelitis was 5.8 per 1,000 school age children.

Piazza, A., "Trends in Food and Nutrient Availability in China, 1950-1981," World Bank Staff Working Paper No. 607, 1983.

"Preliminary Report on Disease Surveillance in East City, Beijing," (in Chinese), Chinese Journal of Preventive Medicine, 15 (1981): 9-13.

Data is presented on the age distribution of population, incidence of communicable diseases, and percentage of deaths by cause in East City, Beijing, 1979.

Prost, A., et.al., "Health Sector Issues in Shandong Province," PHY Technical Notes, No. 18, World Bank, April, 1983.

"Protective Effect of Live Attenuated Measles Vaccine," (in Chinese), Chinese Journal of Epidemiology, 4 (1983): 1-3.

Protective rate within 2 years after primary immunication was 96 percent. Protective rate dropped to 86 percent by 3rd to 4th year, and to 71 percent in the 5th year.

Qian, S.G., and Shaw, J.Y., "Distribution of Newborn Weights in Shanghai," (in Chinese), Chinese Journal of Obstetrics and Gynecology, 15 (October, 1980): 198-201.

Ren, S.L., Dong, Y.W., and Liu, S.H., "Epidemiological Analysis of Epidemic Meningitis in Xuchang Prefecture," Chinese Journal of Epidemiology, 1 (February, 1982): 8-11.

"Report of a Survey of Paralytic Poliomyelitis in Heilongjian Province," (in Chinese), Chinese Journal of Epidemiology, 4 (1983): 174-175.

Prevalence of paralytic poliomyelitis was 2.84 per 1,000. Rate was 1.97 per 1,000 children age 5 to 9.

"Report of a Survey of Paralytic Polimyelitis in Guangdong Province," (in Chinese), Chinese Journal of Epidemiology, 4 (1983): 161-163.

Prevalence of paralytic poliomyelitis was 1.19 per 1,000. Eighty-six percent of the cases did not receive the vaccination. Prevalence was 0.33 per 1,000 children age 5 to 9.

"Report of a Survey of Paralytic Poliomyelitis in Jilin Province," (in Chinese), Chinese Journal of Epidemiology, 4 (1983): 164-166.

Prevalence of paralytic poliomyelitis was 0.76 per 1,000 population under age 30. The rate was 0.04 per 1,000 before vaccination, during 1950-1964, and 0.02 per 1,000 from 1965-1980. Prevalence was 0.30 per 1,000 children age 5 to 9.

"Report of a Symposium on Rheumatic Heart Disease," (in Chinese), Chinese Journal of Cardiology, 10 (1982): 71-72.

"Report on The Survey of Paralytic Poliomyelitis," (in Chinese), Chinese Journal of Epidemiology, 4 (March, 1983): 140-145.

The national survey was conducted in 12 provinces, including both urban and rural areas, with a total population of 3.5 million. Prevalence of paralytic poliomyelitis was 0.22 in urban cities and 1.0 in rural areas per 100,000 children of age 5 to 9.

Retrospect Analysis of Perinatal Mortality Within 17 Years (1961-1977)," (in Chinese), Chinese Journal of Obstetrics and Gynecology, 13 (October, 1978): 119-122.

Comparison of perinatal mortality at Shanghai First Maternity Hospital with several developed countries.

"Rural Preschool Child Health Care Organization Content and Methods," (in Chinese), Chinese Medical Journal, 95 (August, 1982): 551-556.

Shang, C.M., "Clinical Features, Epidemiology and Control of Endemic Fluorosis," (in Chinese), Chinese Journal of Preventive Medicine, 14 (1980): 27-35.

Shi, S.Z., et.al., "Correctness of Statistics: IMR," (in Chinese), Chinese Journal of Pediatrics, 21 (1983): 213-214.

Jingan district, Shanghai underreports infant mortality by 5 percent.

Song, M.T., "Push Forward Energetically Research on Hepatitis B in Children," (in Chinese), Chinese Journal of Pediatrics, 18 (May, 1980): 65-66.

Among 'healthy' children in Hubei province, 5 percent are HBsAG carriers. Prevalence rate has not changed over the last 20 years.

"Study on Vaccination Schedule of Inactivated Japanese Encephalitis Vaccine," (in Chinese), Chinese Journal of Preventive Medicine, 15 (November, 1981): 360-362.

Su, Y., and Wei, H., "Keshan Disease in Children and its Dietary Prevention," (in Chinese), National Medical Journal of China, 61 (October, 1981): 641-643.

Review of the epidemiologic characteristics of the disease and discussion of dietary preventive measures.

"Survey of Paralytic Poliomyelitis, Eastern District, Beijing," (in Chinese), Chinese Journal of Epidemiology, 3 (1982): 273-276.

Prevalence of paralytic poliomyelitis was 0.06 per 1,000 children 5 to 9.

"Survey of Rheumatic Heart Disease and Rheumatic Fever in Guandong Province," (in Chinese), Chinese Journal of Cardiology, 10 (1982): 8-10.

"Survey on the Epidemiology of Endemic Fluorosis in Shangdong Province," (in Chinese), Chinese Journal of Preventive Medicine, 16 (1982): 359-363.

Survey on distribution of fluoride contents of drinking water and dental and skeletal fluorosis was carried out in 4 counties.

"The Health Sector in China," Population, Health and Nutrition Department, Report No. 4664-CHA, The World Bank, April, 1984.

Thuriaux, M.C., and GBetholancy, B., "Enquete sur la Prevalence des Sequelles de Poliomyelite au niveau des Membres Inferieurs chez les Enfants d'age Scolaire dans les Zones Rurales du Department de Niamey, Niger," Medecine Tropicale, 42 (1982): 545-549.

Extrapolated annual incidence rate for paralytic poliomyelitis was 45 per 100,000 population. Seven to ten higher than routine reported figure.

Wang, N.J., et.al., "Perinatal Mortality and Causes of Death," (in Chinese), Chinese Journal of Obstetrics and Gynecology, 15 (October, 1980): 206-209.

Summary perinatal deaths between 1953 to 1979 in various provinces; data, however, is not presented by year.

Wray, J.D., "Child Care in the People's Republic of China - 1973, Part II," Pediatrics, 55 (May, 1975): 723-734.

Wu, S.Y., et.al., "A Study on the Cause of Failure in Measles Vaccination During Early Infancy," (in Chinese), National Medical Journal of China, 61 (1981): 102-105.

Residual maternal antibody was present in one-third of infants between 4-5 months of age. Seroconversion rates in susceptible infants after vaccination varied with their age, namely, 64 percent, 84 percent, 94 percent and 96 percent in age groups of 4-6, 7-8, 9-11, and over 12 months of age, respectively. Seroconversion rate in infants bearing maternal antibody varied by age.

Wu, Z.Y., et.al., "A Sero Epidemiologic Surveillance of Measles," (in Chinese), Chinese Journal of Epidemiology, 4 (1983): 4-7.

No outbreak of measles occurred among a population where seropositive rate was about 75 percent in patients who had measles with a positive history of previous vaccination. The patients either were under age of one when vaccinated or received a vaccine from a batch which was kept under improper storage.

Xue, B.Q., "Child Health Care Must Be Strengthened," National Medical Journal of China, 62 (1982): 1-3.

Overall prevalence of nutritional anemia in children was about 50 percent in 16 provinces.

Yan, Y.G., et.al., "Summary of National Symposium on Prevention and Treatment of Childhood Hepatitis," (in Chinese), Chinese Journal of Pediatrics, 20 (May, 1982): 120-123.

Prevalence of hepatitis among children less than 14 years of age in 2,089 cities was 810 per 100,000 population in 1979. Fourty-four percent was Hepatitis A; 19 percent, Type B; 23 percent, NANB; and 14 percent, combined Type A and B. In Wuhan city, among 'healthy' children, the prevalence rate was 22 percent for children under 2, and 20 percent for children between 3 to 6. In Shanghai city, the prevalence rate was 30 percent among children under 4 in various nurseries.

Yuan, C.T., et.al., "Efficacy of Meningococcus Group A Polysaccharide Vaccine," (in Chinese), Chinese Journal of Epidemiology, 4 (1983): 207-210.

Group A polysaccharide vaccine was studied in placebo-controlled double blind trials in 274,725 children ages 1-15. Group A polysaccharide vaccine induced much higher antibody response and less side effect.

Zhang, W.Z., et.al., "Rubella Serological Survey - Lonzhou," (in Chinese), Chinese Journal of Preventive Medicine, 4 (1983): 89-91.

Serological conversion survey of population of childbearing age indicated that 98 percent of sample surveyed were positive antibody titer rubella.

Zhang, Y.H., and Su, W.N., "A Review of the Current Impact of Measles in the People's Republic of China," Review of Infectious Disease, 5 (1983): 411-416.

Annual incidence of measles has declined since initiation of vaccination campaigns. Incidence was as high as 1000-5000 cases per 100,000 population before 1965. In 1980 the incidence was 57 per 100,000 population.

Zhao, J.M., et.al., "Investigation on Antibodies Against Respiratory Tract Virus in Children," (in Chinese), National Medical Journal of China, 62 (1982): 723-726.

Positive rate of antibody to Type I parainfluenza virus was 75 percent; to Type III parainfluenza virus, 73 percent; to Type A3 influenza, 42 percent; to respiratory syncytical virus, 29 percent; to Type B influenza firus, 21 percent; and to adenovirus, 23 percent.

Zhao, Z.W., et.al., "Investigation of Immune Reponse to Meningococcal Polysaccharide Vaccine," (in Chinese), Chinese Journal of Epidemiology, 4 (1983): 12-14.

The immune response of 172 children to meningococcal A polysaccharide vaccine was observed. Infants of 6-12 months had a poorer immune response to the vaccine compared with children of age 1-3.

Zheng, Y.H., et.al., "Serological Investigation of Hepatitis B," (in Chinese), Chinese Journal of Epidemiology, 2 (1981): 152-155.

In Guizhou Province, prevalence of HBsAg carriers among 'healthy' population was 6 percent. Ten percent of carriers are children under 10 years of age. Prevalence rate was higher in males (8 percent) than females (3 percent).

Annex Table 1: Comparison of Urban and Rural, Age-Specific Death Rates (%) by Sex, 1957 and 1975 in China

	Urban area				Rural area			
	1957		1975		1957		1975	
Age group	Male	Female	Male	Female	Male	Female	Male	Female
- 1	35.01	35.73	10.23	9.72	75.71	76.62	20.53	19.79
1 - 2	21.42	24.32	5.80	5.62	34.55	37.94	9.20	9.36
3 - 6	5.25	6.44	1.39	1.31	10.65	12.49	3.02	3.27
7 - 9	1.77	1.87	0.84	0.57	3.74	3.68	1.34	1.19
10 - 14	1.31	1.33	0.64	0.40	2.32	2.53	0.85	0.70
15 - 24	1.08	1.66	0.98	0.75	2.37	2.91	1.06	0.91
25 - 29	1.34	2.37	1.14	1.10	2.91	3.69	1.47	1.48
30 - 34	1.85	3.00	1.44	1.38	3.77	4.70	1.82	1.74
35 - 39	2.84	4.19	1.94	1.75	5.12	5.18	2.56	2.39
40 - 49	5.67	6.27	3.76	3.19	8.38	7.04	4.52	4.09
50 - 59	14.65	12.40	10.92	8.88	15.96	12.33	11.79	9.55
60 - 69	34.93	25.73	32.38	23.61	35.85	27.52	31.55	25.14
70 & +	83.77	71.66	99.77	83.24	84.44	73.60	96.89	86.20
Total	8.03	9.21	5.70	5.40	13.28	13.56	7.08	6.63

Source: "Analysis of 30 Years Mortality of Chinese Population," Chinese Journal of Preventive Medicine, 5 (1981): 260.

Annex Table 2: Crude Death Rate of Selected Provinces[1/] and Number and Percentage of Total Death by Age, 0-10, 1982

AGE	POPULATION	BEIJING	TIENJIN	LIAONING	SHANGHAI	FUJIEN	HENAN	GUANDONG	GUIZHOU	GANSU	NINGXIA
		917,966	779,016	3,562,104	1,188,510	2,587,044	7,455,952	5,928,490	2,851,440	1,963,524	385,660
	# Deaths	51,659	46,168	186,877	74,356	148,825	441,173	323,144	237,960	110,348	23,031
	CDR	56.3	59.3	52.5	62.6	57.5	59.2	54.5	83.5	56.2	59.7
0	# Deaths	2,249	2,286	11,735	2,833	10,750	29,687	25,738	45,910	13,306	6,153
	%	4.4	5.0	6.3	3.8	7.2	6.7	8.0	19.3	12.1	26.7
1	# Deaths	202	200	1,744	351	2,425	5,901	6,248	14,280	2,419	1,192
	%	0.4	0.4	0.9	0.5	1.6	1.3	1.9	6.0	2.2	5.2
2	# Deaths	113	127	1,174	221	1,861	3,861	4,199	10,245	1,580	679
	%	0.2	0.3	0.6	0.3	1.2	0.9	0.3	4.3	1.4	3.0
3	# Deaths	72	94	738	150	1,370	2,733	2,642	6,672	1,049	369
	%	0.1	0.2	0.4	0.2	0.9	0.6	0.8	2.8	0.9	1.6
4	# Deaths	54	71	503	10o	1,019	1,936	1,782	4,360	738	253
	%	0.1	0.2	0.3	0.1	0.7	0.4	0.6	1.8	0.7	1.1
5	# Deaths	64	82	415	78	816	1,728	1,531	3,244	547	227
	%	0.1	0.2	0.2	0.1	0.6	0.4	0.5	1.4	0.5	1.0
6	# Deaths	58	84	444	47	680	1,680	1,404	2,434	513	163
	%	0.1	0.2	0.2	0.1	0.5	0.4	0.4	1.0	0.5	0.7
7	# Deaths	68	77	386	54	623	1,625	1,191	1,956	506	117
	%	0.1	0.2	0.2	0.1	0.4	0.4	0.4	0.8	0.5	0.5
8	# Deaths	64	65	382	72	591	1,495	1,046	1,494	472	109
	%	0.1	0.1	0.2	0.1	0.4	0.3	0.3	0.6	0.4	0.5
9	# Deaths	57	67	380	49	496	1,222	918	1,212	394	72
	%	0.1	0.2	0.2	0.1	0.3	0.3	0.3	0.5	0.4	0.3
10	# Deaths	71	57	376	69	498	1,290	945	1,262	429	88
	%	0.1	0.1	0.2	0.1	0.3	0.3	0.3	0.5	0.4	0.4

/1 The selected provinces are of the 10% sampling of the 1982 census.

Source: Ten percent sampling tabulation on the 1982 Population Census of the People's Republic of China, Population Census Office, State Statistical Bureau, October, 1983, Beijing.

Annex Table 3: Perinatal Mortality Rate, Neonatal Mortality Rate, 17 Reporting Units, Between 1953 and 1979

Reporting Unit	Total	No. of Births	Perinatal Deaths		Dead Fetus		Still-births		Neonatal Deaths	
			#	%	#	%	#	%	#	%
Shanghai First Maternity Hospital	1974.1-1978.12	165,317	2,169	13.12	873	5.28	321	1.94	975	5.90
Nanjing Ba Yi Hospital	1953.1-1978.12	34,186	541	15.83	137	4.01	138	4.04	266	7.78
Hanzhou Fourth Hospital	1974.7-1979.6	4,242	71	16.74	24	5.66	22	5.19	25	5.90
Sichuan Medical College Hospital	1977.9-1979.8	2,194	37	16.86	16	7.29	8	3.65	13	5.92
Tienji Maternity Hospital	1974.1-1978.12	19,694	373	18.94	85	4.32	117	5.94	171	8.68
Liaoning Traditional Medicine Hospital	1970.6-1978.12	5,385	111	20.61	25	4.64	28	5.20	58	10.77
Guangxi Medical College Hospital	1963.1-1979.12	36,214	768	21.21	386	10.66	112	3.09	270	7.46
Suzhou Perinatal Center	1979.1-1979.12	8,037	187	23.27	47	5.85	55	6.84	85	10.58
Fujian Maternity Hospital	1974.1-1978.12	13,649	359	26.30	166	12.16	106	7.77	87	6.37
Jinan Maternity Hospital	1976.1-1978.12	10,925	302	27.64	136	12.45	68	6.22	98	8.97
Wenzhou Third People's Hospital	1969.1-1978.12	19,889	665	33.44	234	11.77	129	6.49	302	15.18
Tienjin Medical College Affiliated Hospital	1969.1-1978.12	19,970	700	35.05	232	11.62	126	6.31	276	13.82
Chengdu Third Hospital	1964.1-1979.12	18,260	641	35.10	352	19.40	95	5.24	188	10.36
Kaifong Medical College	1977.9-1979.8	963	29	30.11	3	3.12	7	7.27	19	19.73
Wushun Mineral Enterprise Hospital	1976.1-1979.12	32,792	777	23.69	188	5.73	445	13.57	144	4.39
Hunan Maternity Hospital	1954.1-1978.12	48,395	1,077	22.23	-	-	205	-	-	-
Henan People's Hospital	1971.1-1978.12	11,827	450	38.05	162	13.70	74	6.27	62	5.24

Source: Wang, N.J. et.al., "Perinatal Mortality and Causes of Death," Chinese Journal of Obstetrics and Gynecology, 15 (October, 1980): 206.

Annex Table 4: Infant Mortality Rate, Neonatal Mortality Rate and Percent of Infant Deaths in Neonatal Period, 1949-1978, Beijing

Year	IMR	Neonatal Mortality Rate	% infant deaths in Neonatal Period
1949	117.6	--	--
1950	95.5	--	--
1951	86.6	44.0	51
1952	65.7	35.9	55
1953	59.3	31.5	53
1954	46.1	27.3	59
1955	44.5	21.0	47
1956	35.1	18.0	51
1957	35.4	18.1	51
1958	37.9	17.0	45
1959	35.1	15.6	44
1960	29.8	14.2	48
1961	35.6	14.3	40
1962	21.7	11.3	52
1963	22.3	12.4	56
1964	27.9	11.3	40
1973	11.6	6.1	52
1974	12.5	6.6	53
1975	12.4	7.9	64
1976	10.4	5.2	50
1977	10.1	0.5	64
1978	10.3	7.4	72

Source: Lin, Y.Z., "China's 30 Year Mortality Rate," Chinese Journal of Preventive Medicine, 15 (1981).

Annex Table 5: Prevalence of Anomalies at the Maternity Hospital in Shanghai and Cardiff Maternity Hospital, 1972-76

	Shanghai (rate/1000)	Cardiff (rate/1000)
Anenencephaly	0.24	1.79
Spinabifida	0.35	2.28
Cardiac anomaly	1.07	5.26
Down's	0.64	1.28
Cleft palate	1.38	0.38
Cleft lip	1.25	0.41
hypospadias	0.58	2.90
Talipes	0.76	4.17
Hemangioma	1.29	2.18
accessory digits	1.05	1.17
accessory auricle	2.23	0.23
born with teeth	0.89	0.22
RH immunization	0.17	5.15
ABO incompatibility	5.20	2.56

Source: Chalmers, I., "Better Perinatal Health, Shanghai," The Lancet, No. 1 (1980): 138.

Annex Table 6: Incidence and Case Fatality Rates of Water-Related Diseases, by Province, 1981

Province	Parachalera [a]			Dysentery			Typhoid and Paratyphoid			Viral Hepatitis		
	Reported Cases	Incidence [b] per 100,000	Case Fatality Rate per 100,000	Reported Cases	Incidence [b] per 100,000	Case Fatality Rate per 100,000	Reported Cases	Incidence [b] per 100,000	Case Fatality Rate per 100,000	Reported Cases	Incidence [b] per 100,000	Case Fatality Rate per 100,000
NATIONAL TOTAL	78	-	NA	3,454,741	349	127	75,435	8	455	431,016	44	270
North Region												
Beijing				67,889	753	199	249	3	803	13,269	147	1,010
Tianjin				45,547	602	182	239	3	-	6,059	80	4,348
Hebei				209,268	481	25	5,807	10	60	48,741	93	41
Shanxi				50,708	303	209	2,179	9	321	5,452	22	110
Nei Mongol				51,637	272	128	2,879	15	486	4,077	22	147
Northeast Region												
Liaoning				220,183	626	47	841	2	465	31,380	89	163
Jilin				58,036	261	28	584	-	342	4,857	22	412
Heilongjiang				111,119	344	33	1,535	5	852	12,342	38	130
East Region												
Shanghai				41,945	532	131	693	4	433	11,587	100	1,053
Jiangsu	29	-	NA	80,053	134	19	8,693	15	23	40,081	67	95
Zhejiang	10	-	NA	121,319	315	35	876	2	114	25,430	66	208
Anhui				287,183	586	17	1,245	3	241	21,555	44	125
Fujian	9	-	NA	16,360	64	275	245	-	-	7,726	30	246
Jiangxi				36,552	173	285	1,227	4	407	8,039	24	535
Shandong				219,682	299	22	5,345	7	37	34,650	47	118
Central South Region												
Henan				461,740	629	7	4,437	6	135	12,035	16	199
Hubei				101,402	215	120	2,360	5	169	13,208	28	840
Hunan				74,185	139	233	1,205	2	498	11,365	21	378
Guangdong	30	-	NA	76,784	132	175	2,444	4	450	12,233	21	335
Guangxi				58,927	165	168	1,460	4	2,466	36,244	101	185
Southwest Region												
Sichuan				170,442	172	202	1,079	1	2,687	35,214	36	406
Guizhou				324,641	1,157	314	6,340	23	1,483	3,199	11	1,594
Yunnan				167,216	522	185	11,267	35	444	6,354	20	283
Tibet				16,164	864	377	38	2	-	466	25	1,502
Northwest Region												
Shaanxi				76,340	268	110	597	2	-	8,275	29	133
Gansu				97,590	505	350	2,337	12	513	2,156	11	325
Qinghai				30,943	808	737	119	3	-	1,504	39	133
Ningxia				12,639	333	554	284	7	1,056	1,234	33	-
Xinjiang				128,027	995	252	9,841	76	315	12,284	95	163

[a] The cases reported here are all vibrio cholera, biotype El Tor, which in China is officially referred to as parachalera.

[b] The 1981 provincial population totals used to determine incidence per 100,000 population are given in Table A-5.

Source: These data were provided to the World Bank by the Ministry of Public Health.

Annex Table 7: Immunization Schedule in Rural Areas of China

Age (Years)	Poliomyelitis (per. os.)	Measles	Encephalitis B	Diphtheria Pertusis Tetanus (DPT)	Diphtheria	BCG
6 months	Initial					Initial
7-12 months		Initial		Whole Course		
1			Initial			
2	Repeat	Repeat	Repeat	Reinforce		
3	Repeat					Repeat
4			Repeat			
5					Reinforce	
7	Repeat	Repeat	Repeat			Repeat
10			Repeat			Repeat
11					Reinforce	
12		Repeat				
14						Repeat

Source: Ministry of Health, Beijing.

Annex Table 8: Number of Persons Immunized and Percent Immunized from 5 Vaccines of the Childhood Immunization Program, from 23 Surveillance Points North and South of the Changjiang, 1981

	BCG		MEASLES		POLIOMYELITIS (ORAL)												DPT			JAPANESE B	
					Initial			Booster Doses									Initial	Booster		Initial	Booster
								1 Booster			2 Boosters			3 Boosters				I	II		
	Initial	Booster	Initial	Booster	I	II	III	I	II	III	I	II	III	I	II	III					
Persons to be immunized	35746	20779	75280	175039	98286	88678	88678	163721	144046	144046	35693	25894	25922	15589	15660	15660	92367	80467	30635	81347	267007
Persons not immunized because of contraindications	845	283	935	2255	456	553	553	946	954	954	223	225	223	49	78	78	1162	1405	1514	1386	3141
Persons not immunized for other reasons (unspecified)	670	49	1781	3257	2857	2778	2778	1448	1685	1685	935	963	963	290	291	291	5201	2393	1172	8881	5163
Persons not immunized (total)	1515	332	2716	5512	3313	3331	3331	2394	2639	2639	1158	1188	1186	339	369	369	6363	3998	2686	10267	8304
Persons actually immunized	34231	20447	26564	169527	86973	85147	85147	161327	141407	141407	34535	34706	34736	15250	15291	15291	86004	76469	35949	71090	257803
% actually immunized	95.76	98.40	96.57	96.85	96.33	96.26	96.26	98.53	98.17	98.17	96.76	96.69	96.67	97.83	97.64	97.64	93.11	95.03	93.05	87.38	96.89

Source: This table was adapted from unpublished data provided by the Institute for Epidemiology and Microbiology, Chinese Academy of Medical Sciences.

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Annex Table 9: Incidence and Death Rates per 100,000 Population of Communicable Diseases, East District, Beijing, 1958-1979

Year	Measles		Poliomyelitis		Diptheria		Pertussis		Dysentery		Hepatitis		Typhoid and Paratyphoid Fever	
	Incidence	D.R.	Incidence	D.R.	Incidence	D.R.	Incidence	D.R.	Incidence	D.R.	Incidence	D.R.	Incidence	D.R.
1958	2,680.0	16.6	33.4	1.7	2.1	0	540.0	1.7	2,911.0	20.6	---		7.9	0
1959	2,152.0	16.6	25.6	1.8	2.1	0.2	249.6	0.8	4,721.0	21.5	287.9	0.5	7.8	0
1960	1,582.9	2.6	19.9	1.2	11.8	0.5	28.6	0	2,913.1	16.7	316.1	0.6	4.9	0
1961	1,939.4	9.9	14.6	0.3	23.6	0.5	66.2	0	2,524.3	6.3	82.8	0.9	6.5	0
1962	2,143.8	9.1	1.2	0.1	14.1	0.2	495.7	0.8	2,138.2	2.3	420.9	0.2	12.2	0
1963	1,763.0	5.6	2.2	0.3	5.4	0	272.7	0.5	3,583.0	3.8	447.2	0.2	10.6	0.2
1964	2,040.6	4.8	9.7	0.2	2.6	0	38.5	0	3,970.9	2.7	300.1	0.3	6.9	0
1965	1,570.0	1.9	0.8	0	2.9	0	59.2	0.2	3,883.0	1.3	507.7	0.2	7.6	0.2
1966	18.5	0	0.6	0	---	0	85.4	0	4,538.4	2.6	475.6	0	3.2	0
1967	26.0	0.2	0.3	0	0.2	0	11.2	0	3,586.7	0.3	451.3	0	3.1	0
1968	24.6	0	0.2	0	---	0	62.5	0	2,154.6	0.2	138.4	0.5	1.5	0
1969	565.7	0.8	0.7	0	0.5	0	20.3	0	1,927.0	0	104.8	0.3	0.7	0
1970	109.3	0.2	0.2	0	0.2	0	9.2	0	2,235.6	0	167.8	0	1.8	0
1971	41.1	0	---	0	0.2	0	20.0	0	2,132.1	0.2	323.0	0	3.3	0.2
1972	130.6	0	0.2	0	0.2	0	15.4	0	2,783.6	0	499.3	0.2	8.0	0
1973	76.5	0	---	0	---	0	49.2	0	2,580.7	1.4	374.5	2.1	2.8	0
1974	102.5	0	0.4	0	---	0	7.2	0	3,340.7	2.1	244.1	1.1	7.1	0
1975	12.4	0	0	0	0	0	10.2	0	3,313.9	1.9	406.7	1.2	7.5	0
1976	53.7	0	0	0	0	0	11.3	0	2,212.3	1.9	292.8	1.4	4.4	0
1977	28.4	0	0	0	0	0	3.5	0	1,659.9	1.1	171.9	1.2	2.4	0
1978	37.7	0	0	0	0	0	2.1	0	1,305.2	0.5	169.5	2.4	3.6	0
1979	22.0	0	0	0	0	0	4.1	0	1,147.5	0.8	158.5	1.5	1.8	0

Source: Chinese Journal of Preventive Medicine, 15 (1): 1981.

Annex Table 10: Discovered Versus Reported Cases of Various Notifiable Diseases, from Various Urban and Rural Surveillance Points, 1981

Disease	Rural Surveillance Points					Urban Surveillance Points				
	No. of Surveillance Points Investigated	No. of Persons Investigated	No. of Cases Discovered	No.of Cases Already Reported	% of Cases Already Reported	No. of Surveillance Points Investigated	No.of Persons Investigated	No. of Cases Discovered	No.of Cases Already Reported	% of Cases Already Reported
Dysentery	9	19,315	684	411	60.1	11	58,604	464	389	83.8
Hepatitis	5	19,665	121	112	92.6	11	81,313	616	320	51.9
Poliomyelitis	1	1,579	23	18	78.3	-	-	-	-	-
Influenza	2	2,103	40	9	22.5	-	-	-	-	-
Meningitis	2	4,426	4	2	50.0	1	2,025	1	1	100.0
Measles	4	97,720	131	116	88.5	10	55,265	33	23	69.7
Pertussis	5	9,621	72	66	91.7	5	19,117	9	3	33.3
Typhoid and Paratyphoid fever	1	2,076	1	1	100.0	-	-	-	-	-
Scarlet Fever	2	4,091	4	4	100.0	5	27,258	17	14	82.4
Leptospirosis	1	2,397	3	1	33.3	-	-	-	-	-
Cholera	1	2,076	1	1	100.0	-	-	-	-	-
Malaria	1	2,076	37	30	81.1	-	-	-	-	-
TOTAL	-	-	1121	771	68.8	-	-	1,140	750	65.8

Source: This table was adapted from unpublished data provided by the Institute for Epidemiology and Microbiology, Chinese Academy of Medical Sciences.

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Annex Table 11: Prevalence of Sequella of Poliomyelitis, Urban and Rural, North and South of Changjiang, 1981

	Rural			Urban		
	Population under 30	Cases	Per 1,000 Prevalence	Population under 30	Cases	Per 1,000 Prevalence
South of Changjian						
Kunmin	170,554	222	1.3			
Sichuan	64,033	251	3.9			
Guanjxi	42,378	17	0.4			
Guangdong	92,011	230	2.5	252,523	195	0.8
Hubei				251,860	620	2.5
Jiansu				165,736	106	0.6
SUBTOTAL	368,946	720	1.9	670,119	921	1.4
North of Changjian						
Heilongjiang	74,714	159	2.1	72,167	228	3.2
Jilin	1,219,853	877	2.1	217,552	360	1.6
Liaoning	238,336	137	0.6	96,989	101	1.0
Shangdong	55,191	34	0.6	101,983	136	1.3
Tienjin	82,300	130	1.6			
Beijing				178,269	190	1.1
SUBTOTAL	1,670,394	1,367	0.8	811,914	1,233	1.5
TOTAL	2,039,340	2,087	1.0	1,492,033	2,154	1.4

Note: Diagnosis for severity of paralysis from polio was based on grading muscle strength, in addition to presence of muscle atrophy in all the cases. The frequency distribution of paralysis grade 0-4 was as follows:

Grade 0-1	(total to near total paralysis)	14.0%
Grade 2	(no strength against gravity)	18.6%
Grade 3	(presence of strength against gravity but not against resistance)	31.3%
Grade 4	(presence of strength against resistance)	36.1%

Source: "Report on the Survey of Paralytic Sequella of Poliomyelitis," Chinese Journal of Epidemiology, 4 (1983): 141.

Annex Table 12: Age and Sex Distribution of Sequella of Poliomyelitis from 34 Urban and Rural Surveillance Points, 1981

	URBAN							RURAL						
	Population Under 30			Cases			0/00 Prev-	Population Under 30			Cases			0/00 Prev-
Age	Male	Female	Total	Male	Female	Total	valence	Male	Female	Total	Male	Female	Total	valence
< 1	13,962	12,803	26,765	1	0	1	0.04	23,158	23,697	46,855	1	0	1	0.02
1- 4	51,180	47,285	98,465	12	5	17	0.17	122,484	123,063	245,547	29	30	59	0.24
5- 9	67,869	64,677	132,546	17	12	29	0.22	181,211	185,321	366,532	229	139	368	1.00
10-14	90,607	87,008	177,615	81	55	139	0.77	198,647	186,200	384,847	268	195	463	1.20
15-19	135,015	133,997	266,012	303	205	508	1.89	170,369	169,078	339,447	350	229	579	1.71
20-29	258,586	256,159	514,745	714	542	1,256	2.44	285,547	279,822	565,369	225	139	394	1.70
30	48,074	45,115	93,189	60	41	101	1.08	27,645	28,927	56,572	25	139	39	0.69
Unclear			169,696			106				34,171		14	184	
Total	665,293	647,044	1,482,033	1,188	860	2,154	1.45	1,009,061	1,030,279	2,039,340	1,157	746	2,087	1.02

Source: "Report on the Survey of Paralytic Sequella of Poliomyelitis," Chinese Journal of Epidemiology, 4 (1983): 142.

Annex Table 13: Tuberculosis Prevalence by Province, 1979

Morbidity Rank	Province	Standardized TB[a/] Morbidity Rate (1/100,000)	Standardized TB[a/] Morbidity Rate Relative to National Rate	Standardized Smear Positivity Rate (1/100,000)
	National	717	1.0	187
	North Region			
25	Beijing	409	0.57	101
28	Tianjin	300	0.42	99
24	Hebei	411	0.57	113
21	Shanxi	472	0.66	138
26	Nei Mongol	404	0.56	60
	Northeast Region			
16	Liaoning	608	0.85	178
14	Jilin	662	0.92	159
3	Heilongjiang	1051	1.47	189
	East Region			
29	Shanghai	255	0.36	60
7	Jiangsu	891	1.24	239
17	Zhejiang	593	0.83	156
5	Anhui	970	1.35	244
6	Fujian	914	1.27	318
8	Jiangxi	840	1.17	294
22	Shandong	455	0.63	134
	Central South Region			
12	Henan	773	1.08	180
13	Hubei	666	0.93	238
11	Hunan	776	1.08	202
9	Guangdong	829	1.16	259
19	Guangxi	555	0.77	180
	Southwest Region			
10	Sichuan	813	1.13	201
23	Guizhou	413	0.58	87
27	Yunnan	364	0.51	63
2	Tibet	1202	1.68	310
	Northwest Region			
18	Shaanxi	563	0.79	75
20	Gansu	524	0.73	119
15	Qinghai	647	0.90	108
4	Ningxia	1003	1.40	135
1	Xinjiang	1608	2.24	177

a/ These data were age-adjusted to the 1964 census population of China.

Source: A summarized report on the National Tuberculosis Epidemiology Sample Survey, 1979, was published in the Chinese Journal of Tuberculosis and Respiratory System Diseases, Vol. 5, No. 2, 1982.

Annex Table 14: Daily Per Capita Nutrient Availability, 1950-1982

Year	Per capita Total Unprocessed Grain (Kg.)	Total Energy (KCal)	Total Protein (g)	Total Fat (g)
1950	238	1,543 (1,844)	41	19
1951	252	1,659	44	20
1952	274	1,861	51	24
1953	279	1,879	50	23
1954	283	1,895	50	24
1955	296	2,005	53	25
1956	301	2,051	53	24
1957	303	2,045	55	24
1958	301	2,053	54	26
1959	268	1,722	46	22
1960	242	1,453 (1,875)	39	16
1961	251	1,558	43	16
1962	260	1,660	45	17
1963	264	1,776	46	19
1964	276	1,934	50	22
1965	278	1,967	53	22
1966	286	2,078	53	23
1967	280	2,042	52	23
1968	266	1,931	49	22
1969	259	1,881	48	22
1970	275	2,076 (2,131)	52	23
1971	279	2,082	51	23
1972	274	2,006	49	24
1973	291	2,160	53	25
1974	297	2,194	54	24
1975	302	2,210	55	24
1976	306	2,220	56	24
1977	312	2,236	56	25
1978	327	2,360	58	25
1979	346	2,562	65	31
1980	337	2,487 (2,611)	64	32
1981	342	2,517 (2,650)	65	33
1982	364	2,729	68	38

Source: "Trends in Food and Nutrient Availability in China, 1950-1981," by Alan Piazza, World Bank Staff Working Paper No. 607, 1983, Table 2.1

Annex Table 15: Provincial Per Capita Nutrient Availability, 1979-1980, and Rural Food Expenditures, 1981

Province	Energy (KCal)		Protein (g)		Fat (g)		Annual Rural Food Expenditure per capita/in yuan a/	
	1979	1980	1979	1980	1979	1980	Total	On Staples (% total)
NATIONAL AVERAGE	2,372	2,296	60	58	38	40	114	54
Beijing	1,461	1,502	46	45	46	47	163	47
Tianjin	1,307	1,277	40	37	23	27	126	51
Hebei	2,313	1,998	68	56	48	50	86	61
Shanxi	2,041	1,764	59	51	38	38	86	66
Nei Mongol	1,882	1,577	58	47	32	35	111	52
Northeast Region								
Liaoning	2,139	2,226	60	61	69	68	139	45
Jilin	2,476	2,495	72	69	38	49	152	49
Heilongjiang	2,888	3,084	98	101	44	61	102	60
East Region								
Shanghai	1,742	1,336	48	41	39	33	198	34
Jiangsu	2,888	2,794	76	77	40	40	128	52
Zhejiang	2,863	2,679	66	63	38	41	147	42
Anhui	2,394	2,190	58	53	33	33	118	58
Fujian	2,318	2,384	47	49	28	28	124	50
Jiangxi	2,735	2,578	53	51	29	26	118	56
Shandong	2,549	2,482	70	67	70	71	90	59
Central South Region								
Henan	2,106	2,115	61	60	36	38	89	65
Hubei	2,758	2,299	62	53	36	30	115	57
Hunan	2,906	2,763	58	56	33	31	136	48
Guangdong	2,313	2,387	44	48	30	32	158	39
Guangxi	2,434	2,381	54	50	30	30	116	50
Southwest Region								
Sichuan	2,364	2,389	54	56	33	38	121	51
Guizhou	1,577	1,631	37	38	22	26	105	52
Yunnan	1,758	1,895	43	47	23	27	92	54
Tibet	1,926	2,061	77	81	43	39	NA	NA
Northwest Region								
Shaanxi	2,190	1,832	64	53	36	38	92	67
Gansu	1,722	1,815	54	58	26	30	93	71
Qinghai	1,865	2,079	63	69	42	47	103	61
Ningxia	1,995	2,226	60	65	28	27	89	69
Xinjiang	2,228	2,191	65	63	45	48	99	56

Note: Figures exclude all interprovincial and international trade in food crops. Consequently, the nutrient availability figures for China's three municipalities (Beijing, Tianjin, and Shanghai) and perhaps other regions are gross underestimates of true nutrient availability.

Source: "Trends in Food and Nutrient Availability in China, 1950-1981," by Alan Piazza, World Bank Staff Working Paper No. 607, 1983.

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Annex Table 16: Food Availability by Province, 1979

(Figures are kg per capita per year)

Province	Mid-1979 Population	Processed Total Grains a/	Peanuts	Edible Vegetable Oils	Sugar	Fruit	Pork, Beef & Mutton	Aquatic Products	Milk
NATIONAL AVERAGE	964.45	203.34	1.26	2.20	2.45	6.55	10.57	4.24	1.29
North Region									
Beijing	8.60	122.17	1.10	.62	.00	15.93	12.61	.30	6.60
Tianjin	7.31	113.21	.38	.53	.00	3.29	6.98	4.26	2.55
Hebei	50.81	206.38	1.95	1.94	.10	14.06	6.30	1.77	.60
Shanxi	24.35	184.40	.03	1.06	.39	10.11	5.53	.02	.84
Nei Mongol	18.40	159.00	.00	2.20	2.94	1.44	10.86	.60	6.06
Northeast Region									
Liaoning	34.23	186.11	1.10	1.14	.20	26.92	9.60	12.21	1.21
Jilin	21.69	222.69	.08	1.06	2.94	1.86	9.02	.35	1.22
Heilongjiang	31.51	239.39	.01	.53	5.29	.98	11.06	.52	4.57
East Region									
Shanghai	11.13	136.32	.01	4.49	.00	2.78	16.59	18.14	5.94
Jiangsu	58.63	255.38	.84	3.34	.10	3.19	15.52	5.19	.39
Zhejiang	37.71	249.22	.14	2.55	1.18	5.36	14.55	20.44	.98
Anhui	47.58	205.62	1.19	3.08	.00	1.97	10.28	1.11	.09
Fujian	24.69	182.96	2.04	1.50	14.60	4.52	8.15	17.43	.49
Jiangxi	32.06	241.90	.81	3.26	2.06	1.69	9.02	1.99	.22
Shandong	71.96	203.91	6.33	3.78	.10	22.08	10.77	8.28	1.01
Central South Region									
Henan	71.27	182.33	.81	2.02	.00	6.61	7.18	.31	.27
Hubei	46.04	243.25	.62	3.87	.00	2.48	11.15	.00	.45
Hunan	51.94	234.76	.36	2.73	.78	2.04	14.35	2.38	.12
Guangdong	56.37	183.35	3.27	1.76	14.21	4.36	10.67	1.61	.34
Guangxi	34.36	202.93	1.81	1.41	11.27	4.09	10.48	17.48	.07
Southwest Region									
Sichuan	97.40	194.85	.52	2.11	1.86	2.59	14.84	.46	1.26
Guizhou	27.08	134.05	.23	1.14	.29	1.35	8.05	.13	.19
Yunnan	31.13	149.95	.23	.44	5.10	2.82	7.95	.43	.54
Tibet	1.81	154.45	.00	1.23	.00	1.27	27.06	.00	63.71
Northwest Region									
Shaanxi	27.93	197.22	.11	1.58	.00	7.65	8.79	.09	2.05
Gansu	18.84	153.21	.00	1.23	.10	3.51	6.60	.01	1.09
Qinghai	3.68	147.04	.00	4.58	.00	1.01	19.59	.86	25.51
Ningxia	3.66	181.13	.00	2.02	.39	5.10	4.07	.11	1.04
Xinjiang	12.44	197.45	.02	3.17	2.94	10.29	8.24	.47	5.33

Note: The term "availability" refers to food available for human consumption net of trade, milling, seed use, feed grains, manufacturing uses and waste.

Note: Figures exclude all interprovincial and international trade in food crops.

Note: Provincial breakdowns for vegetables, poultry meat, other meats, eggs and animal fats are not available. Energy from these five commodities represents less than 5% of the total energy available in the average diet of the Chinese. The figures for energy, protein and fat contributed by these five commodities to the national average diet have been added directly to the nutrient availabilities supplied by the other 16 commodities for which provincial production data is available.

a/ Total grains includes rice, wheat, corn, sorghum, millet, tubers, soybeans, pulses and other minor grains: see also Table D-1.

Source: "Trends in Food and Nutrient Availability in China, 1950-1981," by Alan Piazza, World Bank Staff Working Paper No. 607, 1983.

Annex Table 17: Malnutrition in China - Percentage of Children Stunted, 1975

Age	Males			Females		
	Urban Beijing	National urban	National suburban	Urban Beijing	National urban	National suburban
3-3.5	1.7	4.4	21.8	0.3	4.4	24.2
5-5.5	1.3	5.9	21.5	1.4	3.8	24.5
7-8	1.1	4.4	26.1	1.9	5.8	26.8
9-10	1.2	4.5	23.0	4.8	6.9	33.0
11-12	8.4	10.6	37.1	6.2	13.1	43.6
13-14	16.1	22.7	50.0	4.8	11.1	34.8
15-16	10.6	14.9	39.0	3.0	4.0	10.0
17-18	4.1	7.6	23.6	2.0	2.7	7.5

Source: Based on estimates of children's weight for height calculated from data collected by MOPH in a 1975 survey of nine cities.

Notes: (i) "Stunting" is defined in terms of a child having low height for his age; specifically a child is defined as stunted if his height is less than 90% of the median height for children of that age according to the NCHS standard. Nutritionists regard stunting as the appropriate measure for chronic (but not necessarily severe) malnutrition.

(ii) The national urban areas for which data are reported in this table are from a survey of nine cities - three in northern China, three in central China, and three in the south. The suburban areas are ones located just outside these nine cities; they are, therefore, probably somewhat better off than typical rural areas. The data from urban Beijing are from the same survey.

Source: D.T. Jamison and F.L. Trowbridge, "The Nutritional Status of Children in China: A Review of the Anthropometric Evidence," Supplementary Paper No. 8 to World Bank Report No. 4664-CHA, "The Health Sector in China."

Annex Table 18: Nine-City Survey of Anthropometric Status, Urban and Suburban Areas, 1975

	Height						Weight							
	Height in cm.		NCHS Height-for-Age a/		Height-for-Age, Z-scores b/		Weight (in kg.)		NCHS Weight-for-Age a/		Weight-for-Age, Z-scores b/		NCHS Weight-for-Height a/	
	Urban	Suburban	Urban	Suburban	Urban	Suburban	Urban	Suburban	Urban	Suburban	Urban	Suburban	Urban	Suburban
Males														
0-1 month	50.4	50.2	96.2	95.4	-0.8	-1.0	3.3	3.2	85.1	85.0	-0.9	-1.1	93.8	96.3
6-8 months	68.1	66.8	98.8	96.1	-0.3	-1.0	8.2	7.8	98.6	93.4	-0.1	-0.6	102.8	102.8
12-13 months	73.4	73.7	97.3	96.7	-0.8	-1.3	9.7	9.0	91.7	85.1	-0.8	-1.3	97.1	96.4
24-30 months	86.3	83.6	98.3	94.9	-0.3	-1.3	11.8	11.3	93.3	87.2	-0.7	-1.3	97.3	96.8
3-3.5 years	93.8	88.5	96.3	91.3	-0.8	-1.7	13.6	12.6	89.9	84.3	-0.9	-1.7	98.4	100.3
4-4.5 years	107.3	103.9	96.1	93.3	-0.8	-1.6	16.9	16.4	89.1	83.9	-1.0	-1.4	94.8	93.7
7-8 years	130.6	115.3	97.6	93.6	-0.3	-1.0	31.8	19.6	97.4	83.4	-1.1	-1.5	93.5	94.8
10-11 years	134.4	118.7	95.0	93.4	-0.5	-1.7	27.3	26.0	81.3	77.9	-1.3	-1.4	93.9	97.6
13-14 years	149.8	143.9	93.7	90.8	-1.3	-1.9	36.5	33.9	73.3	70.9	-1.4	-1.8	--	--
16-17 years	165.6	161.0	94.5	91.9	-1.4	-2.0	58.9	47.9	79.8	74.4	-1.5	-1.9	--	--
Females														
0-1 month	50.0	49.7	96.6	96.0	-0.8	-0.9	3.3	3.2	87.8	87.3	-0.7	-0.7	93.8	93.4
6-8 months	66.7	65.4	98.7	95.8	-0.3	-0.8	7.6	7.3	96.8	93.9	-0.1	-0.6	102.3	102.3
12-13 months	74.1	73.3	97.4	95.8	-0.7	-1.3	9.8	8.4	91.2	83.8	-0.8	-1.4	96.3	94.8
24-30 months	85.3	82.2	97.1	93.5	-0.7	-1.3	11.6	10.7	91.5	85.7	-0.8	-1.4	97.0	96.5
3-3.5 years	92.8	88.3	96.6	91.9	-0.8	-1.8	13.1	12.3	88.7	83.5	-1.0	-1.4	99.1	100.4
4-4.5 years	106.5	102.8	96.8	93.7	-0.8	-1.8	16.5	15.6	90.9	86.0	-0.8	-1.3	93.8	93.9
7-8 years	119.3	114.3	96.6	93.5	-0.7	-1.6	20.6	19.2	87.5	82.4	-0.9	-1.3	94.5	93.4
10-11 years	134.8	130.2	95.3	91.5	-1.0	-1.8	37.1	25.4	77.8	73.0	-1.3	-1.6	--	--
13-14 years	150.7	145.7	95.0	91.8	-1.3	-2.0	36.5	33.8	70.8	74.2	-1.2	-1.6	--	--
16-17 years	156.8	154.3	96.4	94.8	-0.9	-1.3	47.6	46.4	84.8	83.3	-1.1	-1.3	--	--

Note: "Urban" data are from within the city proper; "suburban" data were collected in the countryside just outside the city. These data come from a 1975 survey conducted in nine cities -- three northern, three central and three southern.

a/ The NCHS Standards are based on a US National Center for Health Statistics sample of US children; figures given are percentages of NCHS median figures.

b/ Z-scores represent the number of standard deviations above (+) or below (-) the NCHS median that an entry is.

Source: D.T. Jamison and F.L. Trowbridge, "The Nutritional Status of Children in China: A Review of the Anthropometric Evidence," Supplementary Paper No. 8 to World Bank Report No. 4664-CHA, "The Health Sector in China."

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Annex Table 19: Percentage of 7-Year Old Children Malnourished, Sixteen Provinces, 1979

PROVINCES	BOYS				GIRLS			
	% Stunted		% Low Weight-for-Age		% Stunted		% Low Weight-for-Age	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
National Average:	2.6	12.7	7.6	13.1	2.7	13.1	8.7	14.7
North Region								
Beijing	0.7	8.4	3.8	10.2	0.7	8.1	4.0	10.2
Tienjin	0.5	3.8	2.9	4.4	1.6	6.2	5.7	7.4
Shanxi	1.2	11.9	4.1	10.9	3.4	11.1	8.7	14.7
Northeast Region								
Liaoning	2.1	5.5	7.6	6.8	1.7	10.0	10.6	10.6
Heilongjiang	1.3	19.5	5.9	15.4	0.8	16.6	4.8	16.6
East Region								
Shanghai	1.3	9.0	5.9	12.9	0.6	7.5	6.1	12.7
Anhui	2.2	5.4	7.2	7.4	1.5	6.1	7.8	8.7
Fujian	6.3	13.3	10.4	17.4	4.9	9.3	10.6	12.7
Shandong	2.1	11.9	6.2	11.3	2.9	15.6	7.4	16.6
Central South Region								
Guangdong	1.3	19.2	6.4	23.0	2.3	10.1	11.1	25.8
Hunan	4.3	12.9	11.1	17.6	4.1	17.9	9.0	18.7
Hubei	1.3	12.7	5.4	13.6	1.9	12.9	5.4	14.5
Southwest Region								
Yunnan	5.8	10.4	15.6	12.3	3.4	10.2	10.9	15.6
Sichuan	7.5	37.1	11.1	26.4	8.1	35.6	14.2	29.8
Northwest Region								
Shaanxi	2.0	19.8	6.3	16.1	4.4	20.0	10.0	15.4
Gansu	2.9	11.1	8.9	14.2	3.8	12.7	12.1	18.9

Source: D.T. Jamison and F.L. Trowbridge, "The Nutritional Status of Children in China: A Review of the Anthropometric Evidence," Supplementary Paper No. 8 to World Bank Report No. 4664-CHA, "The Health Sector in China."

Annex Table 20: Heights and Weights of 7-Year Old Children in Urban and Rural Areas of 16 Provinces, 1979

Province	Boys				Girls			
	Height (cm)		Weight (kg)		Height (cm)		Weight (kg)	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
NATIONAL TOTAL	121.2 (4.97)	117.3 (4.92)	21.3 (2.40)	20.3 (2.13)	120.4 (5.03)	116.3 (4.81)	20.63 (2.44)	19.6 (2.14)
North Region								
Beijing	123.2 (4.77)	118.3 (4.80)	22.3 (2.52)	20.7 (2.21)	123.0 (5.06)	117.7 (4.87)	21.8 (2.60)	20.2 (2.27)
Tianjin	123.8 (4.75)	120.0 (4.73)	22.8 (2.63)	21.3 (2.13)	121.9 (5.21)	1181.0 (4.64)	21.6 (2.74)	20.3 (2.20)
Hebei	NA	NA	NA	NA	NA	NA	NA	NA
Shanxi	121.5 (4.41)	117.3 (4.75)	21.4 (2.04)	20.4 (2.03)	119.7 (4.90)	115.7 (3.89)	20.4 (2.20)	19.3 (1.84)
Nei Mongol	NA	NA	NA	NA	NA	NA	NA	NA
Northeast Region								
Liaoning	121.6 (4.93)	118.8 (4.47)	21.1 (2.26)	21.1 (2.17)	121.0 (4.81)	117.3 (4.99)	20.3 (2.34)	20.3 (2.39)
Jilin	NA	NA	NA	NA	NA	NA	NA	NA
Heilongjiang	122.3 (4.87)	115.8 (4.68)	21.6 (2.41)	19.9 (1.99)	121.7 (4.52)	115.8 (4.98)	20.7 (2.05)	19.4 (2.10)
East Region								
Shanghai	112.6 (4.99)	118.0 (4.71)	22.0 (2.67)	70.4 (2.22)	122.2 (4.61)	117.3 (4.43)	21.3 (2.73)	19.6 (1.98)
Jiangsu	NA	NA	NA	NA	NA	NA	NA	NA
Zhejiang	NA	NA	NA	NA	NA	NA	NA	NA
Anhui	121.3 (4.83)	118.5 (4.26)	21.3 (2.35)	20.9 (2.09)	120.3 (4.39)	117.8 (4.46)	20.2 (2.02)	20.1 (2.03)
Fujian	119.4 (5.10)	117.0 (4.76)	20.8 (2.32)	19.9 (2.10)	118.3 (4.63)	116.8 (4.47)	20.1 (2.22)	19.6 (1.97)
Jiangxi	NA	NA	NA	NA	NA	NA	NA	NA
Shandong	121.8 (5.07)	117.8 (5.20)	21.7 (2.31)	20.3 (2.16)	120.3 (5.14)	115.9 (4.90)	20.7 (2.34)	19.5 (2.21)
Central South Region								
Henan	NA	NA	NA	NA	NA	NA	NA	NA
Hubei	121.2 (4.31)	116.9 (4.39)	21.3 (2.14)	20.0 (1.90)	120.6 (4.74)	115.7 (4.21)	21.0 (2.30)	19.3 (1.83)
Hunan	120.1 (4.93)	116.4 (4.14)	20.6 (2.23)	19.7 (1.90)	119.4 (4.93)	115.31 (4.90)	20.2 (2.23)	19.2 (2.07)
Guangdong	121.7 (4.34)	115.8 (4.64)	21.1 (2.12)	19.3 (1.83)	121.2 (5.27)	115.1 (4.54)	20.4 (2.53)	18.6 (1.37)
Guangxi	NA	NA	NA	NA	NA	NA	NA	NA
Southwest Region								
Sichuan	118.7 (4.97)	113.3 (4.93)	20.3 (2.13)	19.2 (1.98)	1181.1 (5.16)	112.9 (4.93)	19.6 (2.10)	18.5 (2.0)
Guizhou	NA	NA	NA	NA	NA	NA	NA	NA
Yunnan	118.8 (4.37)	117.3 (4.44)	20.1 (2.17)	20.0 (1.79)	119.2 (4.39)	116.3 (4.23)	20.0 (2.17)	19.2 (1.81)
Tibet	NA	NA	NA	NA	NA	NA	NA	NA
Northwest Region								
Shaanxi	120.7 (4.47)	116.2 (5.23)	21.2 (2.18)	20.1 (2.20)	119.4 (5.03)	115.0 (4.77)	20.6 (2.57)	19.5 (2.11)
Gansu	120.3 (4.63)	117.6 (4.83)	20.8 (2.16)	20.1 (2.05)	119.4 (4.71)	115.0 (5.06)	20.6 (2.36)	19.3 (2.31)
Qinghai	NA	NA	NA	NA	NA	NA	NA	NA
Ningxia	NA	NA	NA	NA	NA	NA	NA	NA
Xinjiang	NA	NA	NA	NA	NA	NA	NA	NA

Note: The standard deviations of the distribution of heights and weights are shown in parenthesis below the mean values. The figures reported are for children between the ages of 7 and 8 years of age.

Source: D.T. Jamison and F.L. Trowbridge, "The Nutritional Status of Children in China: A Review of the Anthropometric Evidence," Supplementary Paper No. 8 to World Bank Report No. 4664-CHA, "The Health Sector in China."

Annex Table 21: Prevalence of Anemia 1/ Among Children in Daycare Centers and Nurseries, Beijing, 1979-1980

	Number Examined	Hemoglobin (Hg.) Level: Mean Hg. %	Proportion of children below 12% Hg.	Proportion of children below 11% Hg.
May 1979				
AGE 1/2-3				
Daycare center 1	56	12.9 ± 1.3	19.4	9.7
Daycare center 2	73	12.2 ± 1.4	35.6	17.8
Daycare center 3	136	11.7 ± 1.2	56.4	27.1
Daycare center 4	53	12.2 ± 1.4	33.9	10.7
AGE 3-6				
Nursery center 1	159	12.2 ± 1.3	34.1	15.0
Nursery center 2	148	12.0 ± 1.2	46.2	19.2
Nursery center 3	147	11.7 ± 0.6	59.4	34.4
May 1980				
AGE 1/2-3				
Daycare center 1	95	13.0 ± 1.6	22.1	9.5
Daycare center 2	118	12.5 ± 1.1	31.4	4.2
Daycare center 3	177	13.2 ± 1.3	14.7	4.0
Daycare center 4	66	12.6 ± 1.1	18.2	4.5
AGE 3-6				
Nursery 1	166	12.6 ± 0.9	22.9	1.2
Nursery 2	132	13.1 ± 1.2	18.9	0.8
Nursery 3	121	12.3 ± 0.9	34.7	1.6

1/ Anemia is defined as a hemoglobin level less than 12 percent.

Source: Lin, D.S., et.al., "Nutritional Survey in Urban Nurseries and Kindergartens of Beijing during 1979-1980," National Medical Journal of China, 61 (1981): 585.

Annex Table 22: Prevalence and Intensity of Ascariasis in Selected Areas of Shandong Province

Area	Date	Age Groups	Number of People Examined	Prevalence of Ascariasis	Mean Number of Eggs per Gram in Feces of Positive Cases
YANTAI Prefecture	1923-24	Total	890	81.4	-
3 villages less than 20 miles from the city (Source: Cort et al.)		0 - 9	146	93.0	29,300
		10 - 19	256	95.0	23,300
JINAN Municipality	1937	Total	1,190	81.0	16,900
13 villages around Lungshan 23 miles east of Jinan (Source: Winfield)		0 - 9	366	78.0	25,500
		10 - 19	288	94.0	16,900
JINAN City	1938	Total	2,751	35.4	10,600
(Source: Winfield & Ta)		0 - 9	721	42.0	12,300
		10 - 19	1,177	38.3	9,800
JINAN Municipality	1973-74				
School sample in Zhangqiu county (Unpublished)		0 - 9	140	91.4	37,300
		10 - 19	137	89.1	9,500

Note: Detailed figures do not show any significant difference between males and females.

Source: "Health Sector Issues in Shandong Province," A. Prost, et. al., Population, Health and Nutrition Technical Notes, GEN 18, World Bank, 1983.

Annex Table 23: Percent Distribution of Maternal and Child and Children's Hospitals, by Province, 1980

Region	Total Number Hosp.	Total Number Beds	Beds per 1,000 Population	MATERNAL AND CHILD HOSPITALS Hosp.	% Total Hosp.	Beds	% Total Beds	CHILDREN'S HOSPITALS Hosp.	% Total Hosp.	Beds	% Total Beds
NATIONAL TOTAL	65,450	1,992,176	2.0	135	0.2	11,013	0.6	24	0.04	5,407	0.3
North Region											
Beijing	393	28,495	3.2	3	0.8	412	1.4	3	0.8	771	2.7
Tianjin	332	18,753	2.5	3	0.9	167	0.9	1	0.3	434	2.3
Hebei	4,336	87,584	1.7	8	0.2	437	0.5	1	0.02	40	0.05
Shanxi	2,346	69,141	2.8	-	-	-	-	1	0.04	300	0.4
Nei Mongol	1,760	47,271	2.5	2	0.1	60	0.1	-	-	-	-
Northeast Region											
Liaoning	1,688	109,252	3.1	11	0.6	1,163	1.1	1	0.06	200	0.2
Jilin	1,239	60,682	2.7	4	0.3	637	1.0	2	0.2	325	0.5
Heilongjiang	1,766	93,325	2.9	4	0.2	280	0.3	1	0.06	300	0.3
East Region											
Shanghai	399	49,363	4.3	8	2.0	1,195	2.4	1	0.2	300	0.6
Jiangsu	2,457	116,228	2.0	4	0.2	710	0.6	2	0.1	415	0.4
Zhejiang	3,334	63,195	1.7	3	0.1	390	0.6	-	-	-	-
Anhui	3,083	76,283	1.6	4	0.1	353	0.5	-	-	-	-
Fujian	1,130	46,172	1.8	1	0.1	200	0.4	-	-	-	-
Jiangxi	2,189	69,716	2.1	4	0.2	609	0.9	1	0.05	360	0.5
Shandong	2,552	117,134	1.6	3	0.1	360	0.3	1	0.04	80	0.07
Central Region											
Henan	2,530	111,720	1.5	18	0.7	976	0.9	2	0.08	202	0.2
Hubei	1,827	112,216	2.4	2	0.1	90	0.08	1	0.05	370	0.3
Hunan	4,402	115,753	2.2	1	0.02	135	0.1	-	-	-	-
Guangdong	2,447	103,697	1.8	36	1.5	1,407	1.4	2	0.08	420	0.4
Guangxi	1,231	47,608	1.3	4	0.3	309	0.6	-	-	-	-
Southwest Region											
Sichuan	10,388	179,426	1.8	4	0.04	415	0.2	1	0.01	40	0.02
Guizhou	4,529	40,835	1.5	2	0.04	230	0.6	-	-	-	-
Yunnan	1,864	60,249	1.9	2	0.1	302	0.5	1	0.05	150	0.2
Tibet	528	4,261	2.2	-	-	-	-	-	-	-	-
Northwest Region											
Shaanxi	3,095	55,161	1.9	2	0.06	60	0.1	1	0.03	400	0.7
Gansu	1,663	33,776	1.8	2	0.1	146	0.4	-	-	-	-
Qinghai	511	10,460	2.8	-	-	-	-	1	0.2	300	2.9
Ningxia	305	7,184	1.9	-	-	-	-	-	-	-	-
Xinjiang	884	47,236	3.7	-	-	-	-	-	-	-	-

Source: "The Health Sector in China," World Bank Report No. 4664-CHA.

Annex Table 24: Examples of Incentives and Disincentives to Discourage more than One Birth per Couple, Various Provinces and Cities of China

Incentives	Disincentives
Sichuan Province	
1. For "working" parents (probably wage-earners):	—
(a) Child welfare subsidies: 5 yuan/month, until only-child is 14 years old.	
(b) Housing benefits for one-child families: Same living space as family of four.	
(c) Education/employment guarantees for only-child: Priority in admission to schools and factories, provided entrance requirements are met.	
2. For peasant families:	
(a) Income supplement: Equivalent to 3 work days per month until only-child is 14 years old.	
(b) Food benefits: Adult's grain ration for only-child.	
(c) Housing/land benefits: Only-child counts as 1.5 persons in distribution of land plots for private use.	
(d) Old-age guarantee: When parents of an only-child become elderly widows and widowers, their living standard will be higher than that of other commune peasants in locality.	
3. Parents may have another child and receive above benefits if first child dies or becomes disabled.	

Incentives	Disincentives
Hunan Province	
1. For officials and wage-earning workers:	1. Return of benefits: For couples who have second child after being rewarded for only having one, they must return all rewards and bonuses already received.
(a) Income supplement: 30-40 yuan annual bonus until only-child is 14 years old.	2. For having third child:
(b) Education/employment/medical treatment guarantees for only-child: Priority in admission to nursery and kindergarten, in hospital treatment, in employment.	(a) Income deductions: 5% of husband's and wife's monthly wages or couple's total workpoints deducted until third child is 14 years old.
(c) Housing benefits for one-child families: Priority in urban housing; same living space as for a 2-child family.	(b) Medical costs (for third child born after January 1, 1980): Child not eligible to participate in medical schemes; no medical benefits during pregnancy/birth of third child; no pay during maternity leave.
(d) Retirement benefits: 5% extra allowance for both husband and wife.	(c) Food costs (for third child born after January 1, 1980): Grain for third child must be obtained at higher price.
2. For rural peasants:	(d) Housing costs (for parents of a third child born after January 1, 1980); no increase in housing space (urban) or lots (rural).
(a) Income supplement: 400 work points annual bonus, until only-child is 14 years old.	(e) No hardship assistance (for parents of a third child born after January 1, 1980): no subsidies for difficulties resulting from having extra child.
(b) Housing benefits for one-child families: Private plots; housing lots the same size as for a 2-child family.	3. Certain cadre and worker parents are excluded for consideration as progressives and award-winners for one year after third child's birth.
(c) Old-age guarantee: Living standard of only-child parents, when old and unable to work, must not be lower than local average.	
3. For couples who have had a sterilization operation, a reverse operation may be carried out at couple's request free of charge, if only-child dies or is seriously crippled.	

Incentives	Disincentives

Anhui Province

1. Education guarantees for child: Priority in admission to nursery and kindergarten.

2. Housing benefits for one-child families: Priority in allocation; same urban housing as for a 2-child family.

3. Food benefits: Adult's grain ration for only-child.

4. Medical benefits:

   (a) Priority in medical treatment and hospitalization for only-child.

   (b) Monthly health expenses for only-child of state workers or collective enterprise workers during child's 4th to 14th year;
   - if son: 5 yuan/month
   - if daughter: 6 yuan/month

   (c) Health expense supplementary workpoints for only-child of peasants, during child's 4th to 14th year:
   - if son: 30 wkpts/month
   - if daughter: 40 wkpts/month

5. Labor recruitment priority for households with one child or two daughters.

6. Economic and other rewards for couples undergoing sterilizations and for medical personnel performing sterilizations well.

7. Parents may have another child and receive above benefits if first child dies or is seriously crippled.

1. Return of benefits: For couples who have second child after being rewarded for only having one, they must return all first child's health expenses or supplementary workpoints already received.

2. Income deductions for parents with third child born within six months after the promulgation of regulation.

   (a) For officers and workers: 5% of total combined income of husband and wife deducted each month for welfare expenses from time when child is 2 weeks to 14 years old.

   (b) For peasant families: 5% of total annual workpoints of husband and wife deducted at year's end as welfare expenses from time when child is 2 weeks to 14 years old; 6% deducted for fourth child; 7% deducted for fifth child.

3. Medical cost: For officers and workers with third or additional child and who have received a reward in the form of health expenses paid for by public funds: All medical expenses of confinement, except emergency cases, must be paid by parents; child not eligible to participate in medical scheme.

4. Food costs: Grain for third or additional child must be obtained at higher price, until child is 14 years old.

Incentives	Disincentives
Anhui Province (continued)	
	5. No hardship/living assistance:
	(a) No coupons for commodities or subsidiary foodstuffs, except cloth coupons, for third or additional child before age 14.
	(b) No subsidies for difficulties resulting from having extra children.
	6. Housing costs: No extra housing space (urban) or lots (rural).
	7. Parents may not be deemed progressive producers or workers for a year after birth of third or additional child.
Tianjin Municipality	
	1. Income deductions:
	(a) For officers and workers with third child: 10% of husband's and wife's monthly wages deducted until child is 14 years old.
	(b) For peasants with third child: 10% of annual income deducted until child is 14 years old.
	(c) For couples with second child before first child is 4 years old: 10% income deductions until first child reaches 4th year.
	(d) For unmarried women with a child: 10% wage deductions until woman reaches marriage

Incentives	Disincentives
Tianjin Municipality (continued)	
	age (23 rural, 25 urban) and gets married.
	2. Officers, workers and office employees, who do not observe the planned birth norms, are not eligible for promotion for two years.
Beijing Municipality	
1. Income supplement for one-child families: 30 yuan awarded annually on June 1 (Children's day).	1. Income deductions for couples with third child: 10% of combined annual income deducted until child reaches 14th year; 15% deducted for fourth child; 20% deducted for fifth child. (Same applies to peasants in communes under municipal jurisdiction.)
2. Maternity leave: Six months' leave with full pay, instead of current 9 weeks, for birth of first child.	2. Maternity leave: Woman with third child receives 9 weeks of maternity leave and must return full amount of 6-month maternity leave pay given her after her first birth.
(For couples who have two children - no penalty or reward.)	
Shanghai Municipality	
1. Usual incentives for one-child families.	1. Income deductions for more than 2 children: 10% of both husband's and wife's monthly wage or workpoints deducted, until third child is 16 years old.
Guangdong Province	
1. Income supplement:	1. Return of benefits: For couples who have second child after being rewarded for only having one,
(a) For cadre, staff or workers	

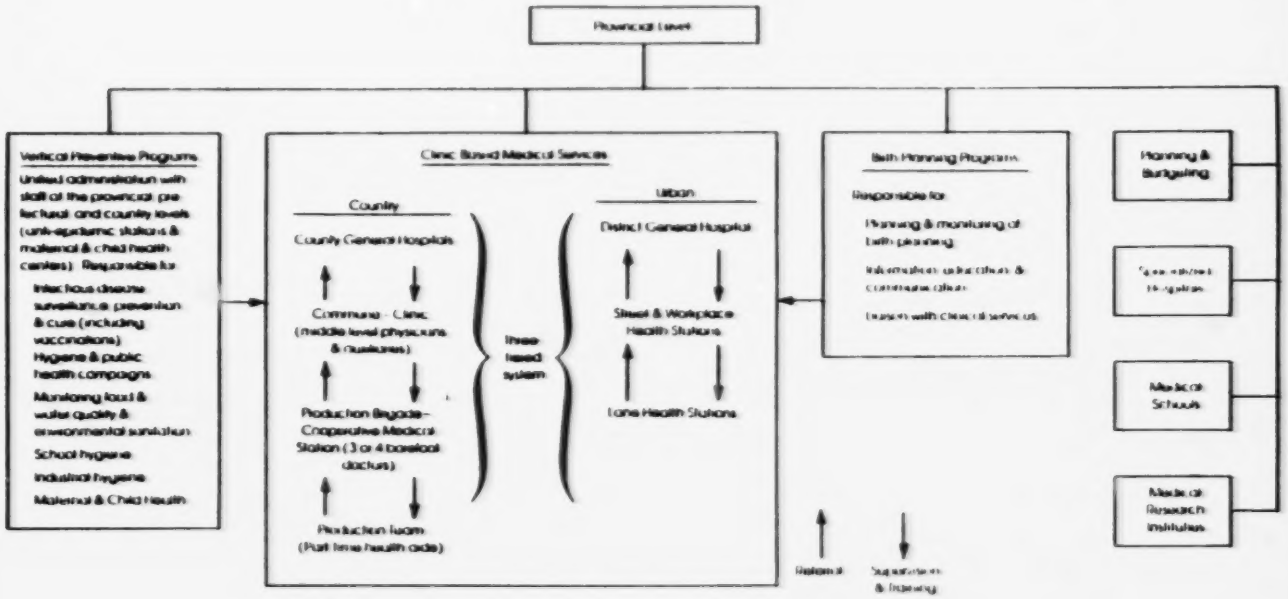
Incentives	Disincentives
Guangdong Province (continued)	
or urban unemployed parents: 5 yuan per month, until only-child is 14 years old. (b) For rural commune members: Monthly workpoints equivalent to 6 workdays until only-child is 14 years old. 2. Education/medical benefits for one-child families: Free nursery and kindergarten up to age 7; free primary to high school education; free medical service for child until 14th year; 3 month's maternity leave for birth of first child. 3. Housing benefits: (a) For urban areas: Priority in living quarters allotments; same housing space as for a 2-child family. (b) For rural areas: Double quota of private plots; precedence in receiving building foundations; allowance for construction material needs. 4. Food benefits: (a) For urban areas: Ration of fuel and nonstaple foods same as for a 2-child family. (b) For rural areas: Only-child's grain ration same as per capita average of basic accounting unit in rural areas. 5. Employment in rural areas: Priority in assignments of industrial and sideline jobs for one-child parents; preferential recruitment in industrial employment and army enlistment for only-child.	they must return all rewards and bonuses already received. 2. Income deductions: (a) 10% of husband's and wife's monthly wages or workpoints deducted. (b) For 4 or more births: 5% additional charge imposed for every additional birth. (c) Duration of charges (a + b): i. For 3 or more children, including fostering or adoption of others: 4th month of pregnancy to child's 14th year. ii. Where birth interval between first and second child is less than 4 years: 4th month of second pregnancy to first child's 4th year. iii. For births outside marriage: 4th month of pregnancy to 9th month after marriage license has been obtained. 3. Food costs: Grain for third or additional child must be obtained at higher price, until child is 14 years old. 4. No hardship/living assistance: (a) No subsidies for difficulties resulting from excessive procreation. (b) No allotted planned supply ration coupons for sundry commodities and nonstaple

Incentives	Disincentives
Guangdong Province (continued)	
6. Retirement/old age benefits:	foods, except cloth ration, from birth to 14th year of child (urban areas).
(a) For cadres, staff, workers: 5% more than normal pension, but no additional payment if 100% pension is paid.	(c) No allotted agricultural and nonstaple foods in kind (rural areas).
(b) For rural commune members: Monthly allowance of work-points equivalent to 5 work-days.	5. No medical benefits:
(c) For couples childless for entire life:	(a) No maternity leave with full pay or workpoint allowance.
i. Cadres, staff and workers: 100% pension.	(b) No medical treatment scheme for third or additional children.
ii. Rural commune members: Allowance as "5-guaranteed families."	(c) No medical assistance in pregnancy/birth expenses of additional children.
7. Possibly a suitable lump sum award from the production unit.	6. Employment for parents:
8. Rewards for late procreation after late marriage for each year of postponement.	(a) For cadres, staff, workers and mothers of illegitimate children: No promotion or awards for 3 years.
9. Rewards to units and to cadres, scientific and technical workers, medical workers, barefoot doctors, rural activists with outstanding results in planned birth.	(b) For commune members: No appointment in industry and sideline jobs that belong to the commune, production brigade or team.
10. Leaves of absence for those who have undergone birth control operations with doctor's certification and payments for periods of rest for those having operations.	7. Housing costs: No addition to accommodate births.
11. Sterilized couples receive anastomosis free of charge upon application, if only-child dies or becomes seriously disabled.	8. For enterprise units that exceed assigned planned birth quota, 2% of profits will be deducted.

Source: From Table A.19 of China, Socialist Economic Development, Vol. III, a World Bank Country Study, 1983.

Annex Chart 1

Organization of Health and Birth Planning Services



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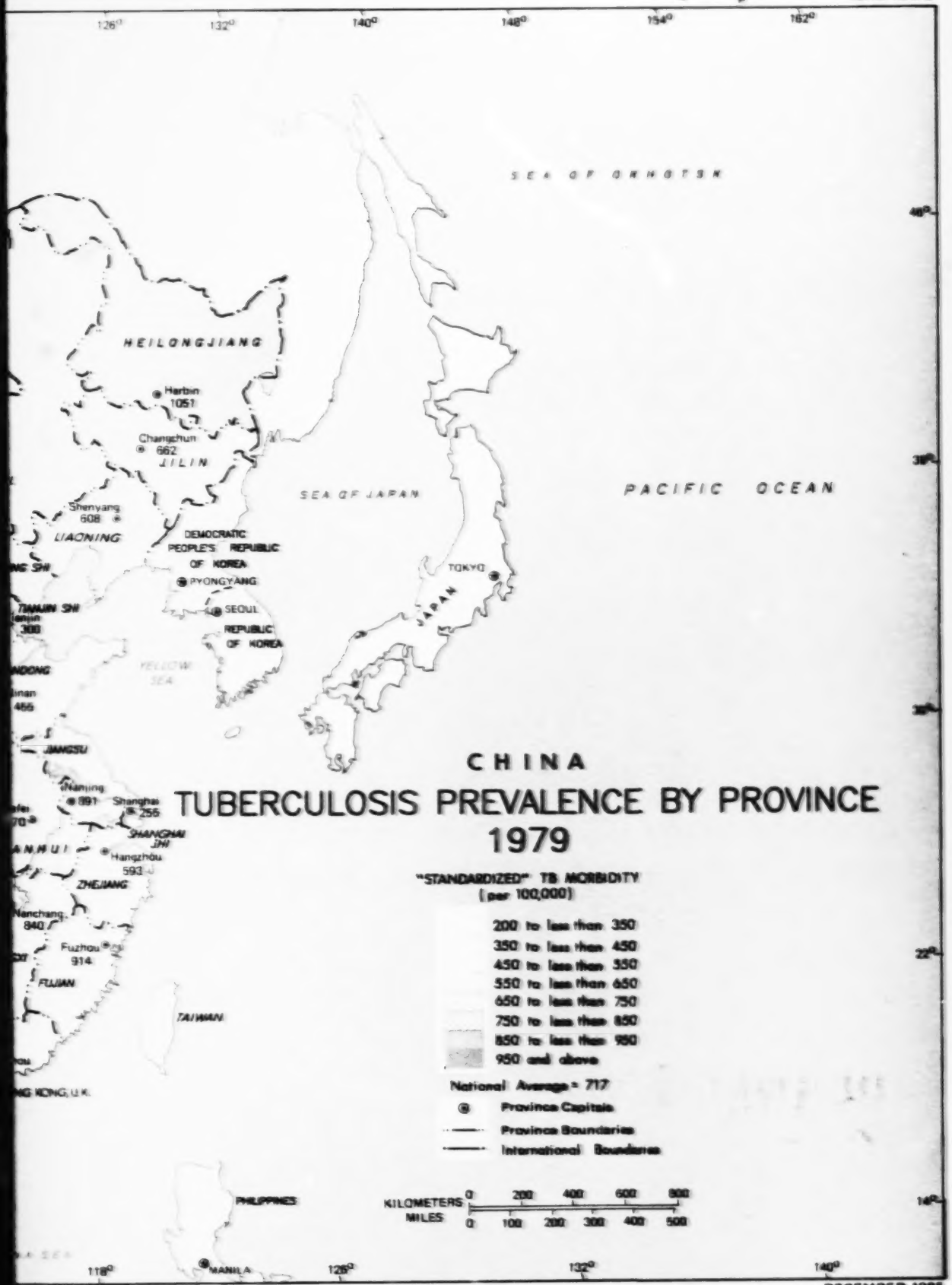

CHINA

TUBERCULOSIS PREVALENCE BY PROVINCE 1979

"STANDARDIZED" TB MORBIDITY
(per 100,000)

- 200 to less than 350
- 350 to less than 450
- 450 to less than 550
- 550 to less than 650
- 650 to less than 750
- 750 to less than 850
- 850 to less than 950
- 950 and above

National Average = 717

- Province Capitals
- Province Boundaries
- International Boundaries

KILOMETERS 0 200 400 600 800
MILES 0 100 200 300 400 500

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CHINA

CRUDE BIRTH AND DEATH RATE BY PROVINCE

1981

132

133

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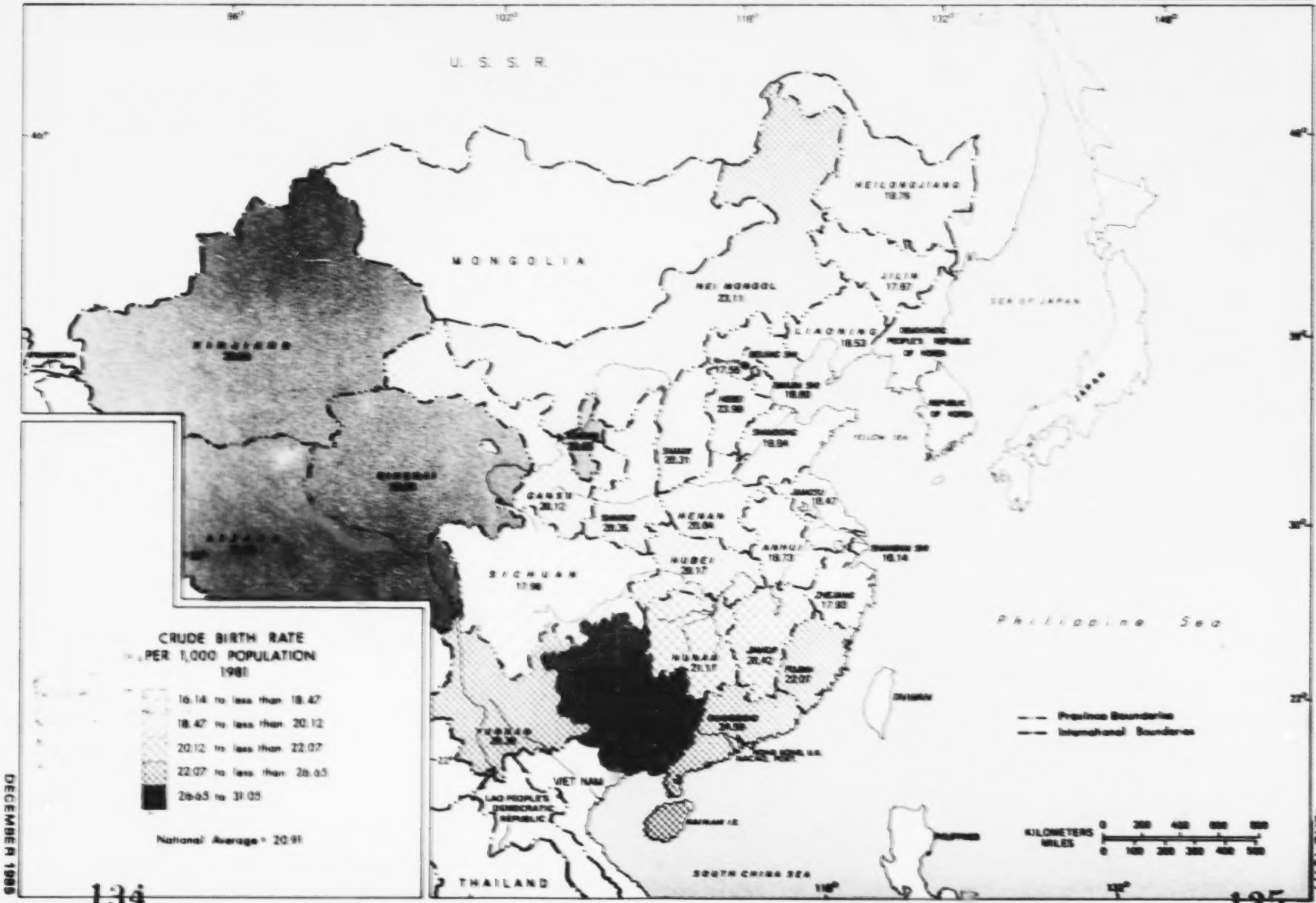

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